

Reg. United States Pat. Off.

Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

Telephone—Bryant 2876.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 55

FEBRUARY 1, 1917

No. 5

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

COPYRIGHT, 1917, BY THE INDIA RUBBER PUBLISHING CO.
Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.**THE RUBBER ASSOCIATION OF AMERICA.**

THE change in the name recommended by the board of directors and unanimously adopted at the annual meeting of The Rubber Club of America, Inc., appears to be well conceived as more accurately descriptive of the present aims and activities of the organization, which have become industrial rather than social. Furthermore, it betokens a keener appreciation on the part of the membership as a whole of that larger mission of practical usefulness which constitutes the principal inheritance of the new Association. The proper solution of the several problems of vital import besetting the American rubber industry demands frank exchange of opinion and hearty coöperation for the common good through the medium of an organized body such as The Rubber Association of America promises to become. Thus it seems to have been the height of good judgment to reflect as officers for the ensuing year those able men who have been so intimately in touch with the developments of the past twelve-month and hence are

exceptionally well equipped to handle the existing situation.

Our problems and opportunities of the present and near future were ably set forth by the distinguished after-dinner speakers at the Rubber Club banquet, as indicated by extracts published elsewhere in this issue. Devoting themselves exclusively to the commercial aspect of these matters, ex-President Taft, Mr. MacRoberts and Colonel Colt convincingly indicated the needs of the American industry, definitely pointed out the pitfalls to be avoided, and offered sound advice for timely action. The other speaker, Bishop DuMoulin, in an address that will be long remembered, discussed America's ethical opportunities, and the enthusiasm with which his wholesome counsel was received emphasized again the gratifying fact that the rubber industry has ever been a leader in this aspect of all commercial relations.

RUBBER TARIFFS OF THE FUTURE.

IN another column will be found a quotation from the "London Times" that shows the feeling that has been aroused by the American invasion of British markets. The fact that English factories were not able to make the goods because they were busy with war orders, nor the fact that the markets were eager for American goods, (these being oftener available) makes not a particle of difference. Nor is the contention of the writer at all unreasonable. In his place any American manufacturer would voice the same complaint and perhaps not as temperately. It is a good guess, therefore, that once the war is over American goods will be handicapped in English markets. A second guess is that an export tariff will be put upon British-grown rubber. Further, as prediction is the motive of this brief, an import tax upon crude rubber will be assessed by our own needy government. Then, there will doubtless follow a downward revision of the tariff on manufactured rubber goods. All of this is in sight, and some, if not all, sure to come.

THE RUBBER INDUSTRY AND CONSERVATION OF NATURAL RESOURCES.

THE report of the special committee of the Chamber of Commerce of the United States regarding combinations to conserve natural resources, and the favorable result of its referendum to the commercial bodies, announced early in January, touch the rubber industry very nearly, for the recommendation of the National Chamber is bound to carry great weight in Congress. As coal, solvent naphtha and the future supply of our present motor-car fuel are involved, the matter is worthy the serious attention of rubber manufacturers.

Most legislation affecting our natural resources, so long exploited, has made no distinction between those which become exhausted or greatly depleted through utilization, and those which to a degree renew them-

selves every year. It is a natural consequence, therefore, that the former now have a tendency toward extinction. Thus to mitigate this as far as possible, the Chamber committee recommends remedial legislation to permit cooperative agreements, under federal supervision, in those industries which involve primary natural resources, on condition that the agreements in fact tend to conserve the resources, to lessen accidents, and to promote the common good. The plan is to enlarge the powers of the Federal Trade Commission beyond its present function of investigation and authorize it to formulate constructive plans for the promotion and safeguarding of public interest under which an industry may operate alike to the benefit of consumers, workmen, and producers. The committee realizes that these are primarily matters of state law and has in mind only such legislation as would bring natural resources under federal statutes and define the conditions under which they may legally become commercial commodities in interstate commerce.

The quantities of products our natural resources are called upon to furnish have greatly increased during the years which have elapsed since our general legislation dealing with interstate trade was enacted. The production of coal from American mines has increased almost fivefold, while the population has increased less than 70 per cent. During the past quarter of a century the yearly drain upon our sources of petroleum has increased sixfold and more. The commercial utilization of natural gas, which fell off in earlier years, has since increased, reaching \$101,000,000 last year, when 628 billion cubic feet were used.

In October the director of the Bureau of Mines said that we have probably reached the climax of our production of crude oil, adding that the Geological Survey estimates that deposits of petroleum as yet undeveloped will scarcely furnish a supply for more than 30 years. If this estimate be correct, our supplies of natural gas may not last so long.

Something like 40 per cent of the coal in the seam has been said by the director of the Bureau of Mines to be lost as far as beneficial utilization is concerned. Millions of barrels of oil have been wasted by being allowed to flow into the streams, by being mixed with water, or by evaporation. There has been no such waste in any other sort of mining. By passing into the air from uncontrolled gas wells, from oil wells, from giant flambeaus, from leaking pipe lines, and from many other methods of waste, natural gas is said to be sacrificed at a rate of not less than one billion cubic feet a day, and probably very much more.

Can any sagacious manufacturer, whether of rubber or other goods, contemplate these facts without realizing the urgent necessity of intelligent cooperation for the common good between the government and producers of American raw materials?

A MONUMENT TO THE INVENTOR OF THE PNEUMATIC TIRE.

THE recent suggestion of F. C. Millhoff that a monument be erected to the man who invented the pneumatic tire is one not to be lightly forgotten. Indeed, it has much to commend it, for while perhaps less spectacular than wireless telegraphy, the aeroplane, the motion picture and similar epoch-making inventions, the pneumatic tire certainly revolutionized transportation and made the automobile possible. But Mr. Millhoff very aptly says:

The man who invented the first pneumatic tire would certainly be entitled to consider himself one of the greatest contributors to human progress, yet not one person in a million even knows his name, and very few ever wondered who he was. If anybody ever badly needed a monument as a protection against oblivion, he is the man.

When that happy time comes that the world finds itself at peace, the motorists, tire and automobile manufacturers of every civilized country might well join in raising a fund for a suitable memorial to Robert William Thomson, the first patentee of a pneumatic tire in England in 1845. The United States, however, is the center of the tire and automobile industry, and if, meantime, Americans decide to honor this worthy pioneer in a great industry, it is easy to foresee that it will be nip and tuck between Akron and Detroit as the site of the memorial.

WITH THE PASSING OF HENRY A. GOULD THE RUBBER trade loses a striking and interesting figure, a "gentleman of the old school." His gentle dignity and precise courtesy were as much a part of his business as of his social life. While he was an able business man, and a pioneer in large undertakings, his leanings were toward the scholarly arts and the betterment of mankind. To his staff he was ever the respected teacher rather than the "boss." A quaint, picturesque personality, we of the trade shall not see his like again.

ALONG WITH THE PREDICTION THAT FINE LEATHER shoes will soon cost \$30 per pair, comes the announcement that "leatherless" shoes are to be worn throughout the West next summer. Leatherless does not mean rubberless, however.

THE INCREASING DEPENDENCE OF THE United States on the tropics for raw materials and foodstuffs not produced in this country is shown by the fact that more than a billion dollars' worth of tropical products were brought into this country during the fiscal year 1916. The exact total, \$1,060,850,416, represented an increase of \$253,208,231 over the year 1915. Imports of rubber, etc., amounted to \$304,000,000 during the fiscal year 1916, against \$280,000,000 in 1915, and \$109,000,000 in 1905, and were exceeded in value only by sugar, coffee and fibers.

The Rubber Club's Seventeenth Annual Banquet.

WHILE the diners may have talked among themselves of recent achievements and present prosperity, our problems and opportunities after the war formed the chief topic of the distinguished after-dinner speakers at the seventeenth annual banquet of The Rubber Club of America, Inc., which was held in the grand ballroom of the Waldorf-Astoria, New York City, on Monday evening, January 8.

Before the banquet was served the diners gathered in an adjoining room and in the congenial atmosphere of an informal reception greeted their friends and renewed acquaintances.

Upon entering the banquet hall one was immediately impressed by a welcome departure in the decorations. Large American flags predominated and were introduced in the simple and pleasing form of sharp-angled trophy stacks at suitable lo-

Each guest found at his place an attractive program and menu with a cover in lavender, green and gold embodying an attractive design including the Rubber Club seal, a sprig of *Hevea* leaves, the western hemisphere, and a man tapping a rubber tree.

After an invocation by The Right Reverend Frank DuMoulin, Bishop-Coadjutor of the Diocese of Ohio, the diners enjoyed an excellent repast and during the addresses that followed manifested great enthusiasm as the salient points of each speaker were brought forth.

A TOAST TO THE LADIES.

At the conclusion of the dinner President Firestone called attention to the fact that for the first time in its history the Rubber Club enjoyed the honor and pleasure of having ladies present to hear the after-dinner speaking. In proposing a toast to "The Ladies," which was heartily drunk, he expressed the belief that the distinguished guests of honor must realize "that the gentlemen composing the great rubber industry have a distinct appreciation of the refined and the beautiful."

PRESIDENT FIRESTONE'S ADDRESS.

President Firestone then continued with the following address, announcing the birth of The Rubber Association of America and touching briefly upon the Rubber Club's activities of the past year and its growth in membership:

As President of the Rubber Club I am very much interested—and I want every member to feel interested—in both its fraternal and business activities. However, as there are many of our members here tonight who have not attended the annual meeting nor taken an active part in it, I know that you will be much interested in the business activities of the Club. I want to say just a word in regard to the rubber industry and the Rubber Club of America, from now on to be known as The Rubber Association of America.

The reason that your directors have recommended this change in name to the members at the annual meeting was that it better represents the true position of the organization. Originally, the New England rubber men gathered together for social purposes only. Out of these meetings grew the Rubber Club of America, the purpose of which was not only to bring the rubber interests together socially, but to promote the welfare of the rubber industry.

This so changed the nature of the organization that the name Rubber Club became misleading, and as a result we have adopted the title, The Rubber Association of America, which more clearly describes this body.

As our raw materials are received from foreign lands, and many of our products are shipped to foreign countries, there is every reason why the rubber interests must have a strong and efficient organization to look after the interests not only of the rubber industry but the entire commercial activities of the United States, which are so vitally affected by our well-being.

Rubber is the most important commodity in the world. It is not only of great importance commercially, but our happiness and social welfare are to a large degree dependent upon it. You will be surprised to know that the rubber manufacturing industry stands among the first few leaders in volume in dollars and cents.

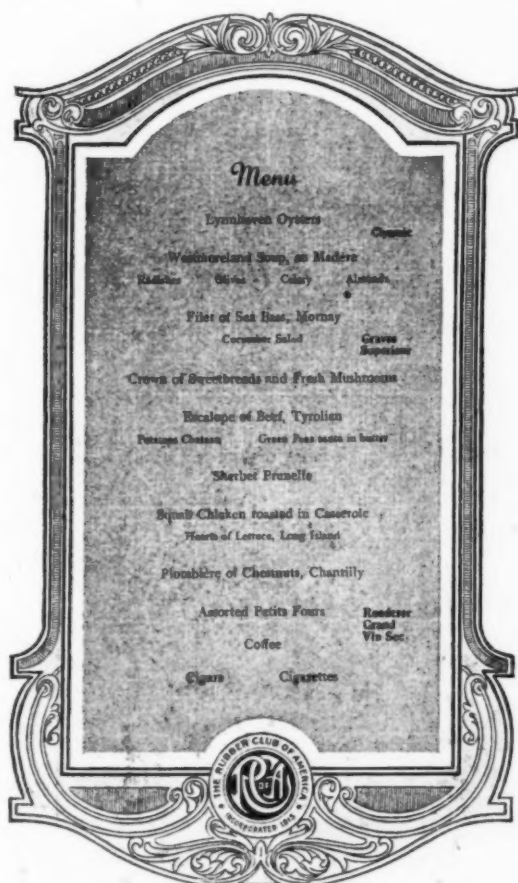
During the past year your Advisory Committee has been very active and held fortnightly meetings effectively dealing with the questions which have been brought before it. The members of this committee have given generously of their time for attendance at these meetings.

A committee on legislation has been closely in touch with measures affecting the industry which have been introduced at Washington. This committee, however, has had comparatively little to do, as no tariff changes have been attempted.

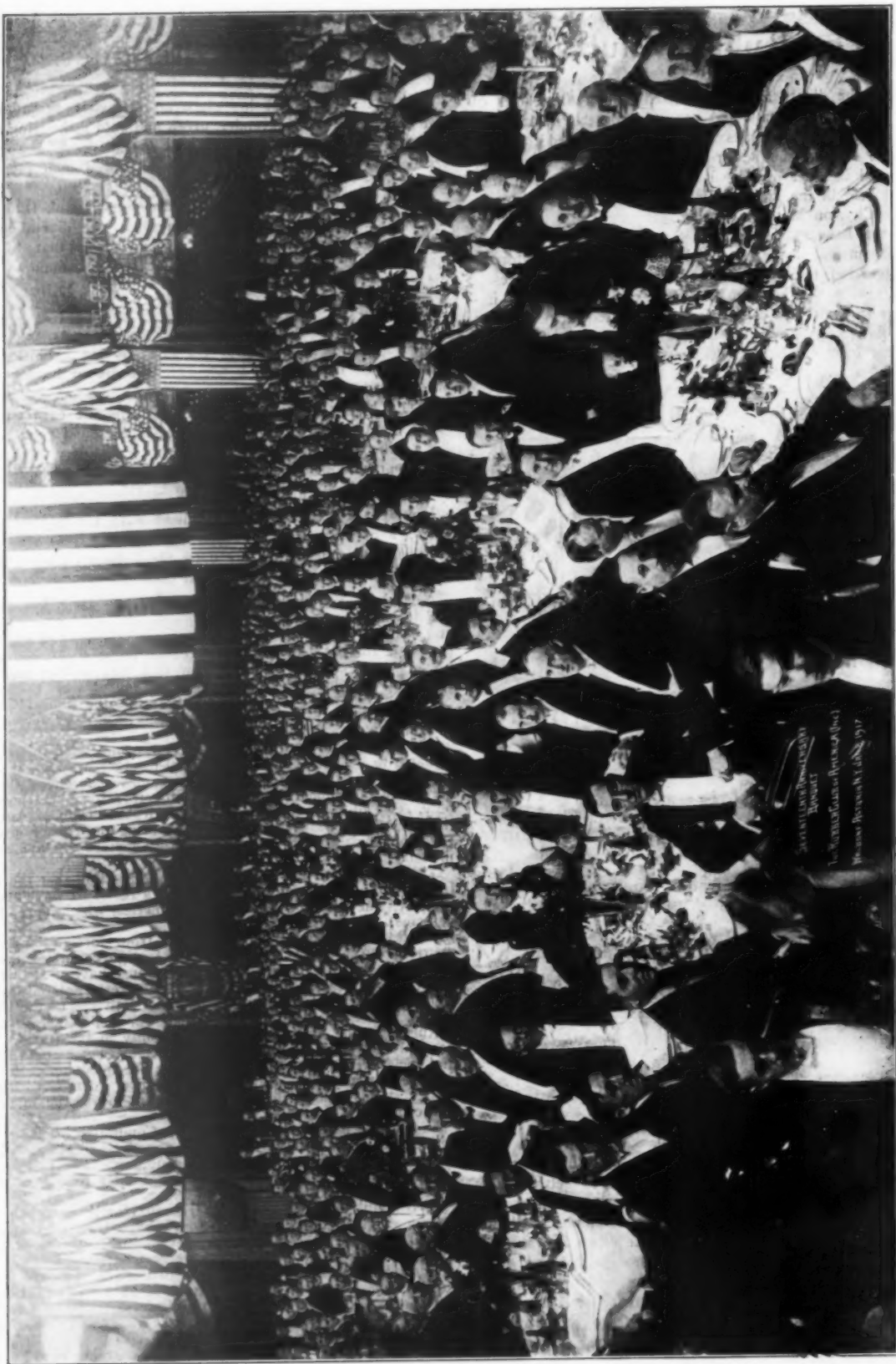
One of the most important efforts of the year was the formation of rules and a uniform contract to govern transactions in crude rubber between importers and dealers and manufacturers.

The committee has submitted a report which was sent to every member and has now been adopted.

An Arbitration Committee to assist in carrying out the rules has been provided for.



cations about the room, producing a tall, narrow effect in harmony with the architectural lines. At the head of the room hung the Rubber Club banner, while the spaces between the trophy stacks and also along the fronts of the two tiers of boxes, occupied by the ladies during the after-dinner speaking, were draped with large flags in a frieze-like effect interspersed with blue banners displaying in true colors the coat of arms of the several states in which the rubber industry flourishes. But the crowning feature consisted of a great American flag, cleverly concealed, which suddenly unfurled to the inspiring strains of the "Star Spangled Banner," and immediately created a happy spirit of patriotic enthusiasm.



SEVENTEENTH ANNUAL BANQUET OF THE RUBBER CLUB OF AMERICA, INC., AT THE WALDORF-ASTORIA, JANUARY 8, 1917.

A Bureau of Statistics was established last May which, it is hoped, will soon be able to distribute accurate information covering the importing of crude rubber and give the members a valuable report concerning the industry in general.

The following divisions are now affiliated with The Rubber Association of America: The Mechanical Rubber Goods Division, The Rubber Sundries Division, The Hard Rubber Manufacturers, The Rubber and Fiber Sole Manufacturers, The Rubber Heel Club of America, The Rubber Reclaimers' Club and The American Rubber Manufacturers' Association of London.

It is hoped that our group organization will be greatly extended in the future and that much benefit will be derived from the closer association of these groups and the open competition bureaus which may be established.

The Committee on National Preparedness has completed its work and will be succeeded by a research committee.

The organization has shown a very satisfactory growth during the past year. On January 1, 1916, we had enrolled 191 firm members and 227 associate members. On January 1, 1917, we had enrolled 231 firm members, an increase of 40, and 235 associate members, an increase of 8—making a total membership of 465. There are still, however, a number of organizations directly interested in the manufacture of rubber goods which are not represented, and it is hoped that there will be an increase in the membership prior to the next annual meeting.

EX-PRESIDENT TAFT ADVOCATES PROTECTION OF OUR INTERESTS ABROAD AND RUBBER GROWING IN AMERICA.

Ex-President Taft, the principal speaker of the evening, manifested a keen insight of the status and needs of the rubber industry gained through four years' residence in the Philippines, where he established a government and made it possible for American capital to grow rubber under the American flag. After reviewing the growth and importance of the rubber industry and referring to the United States as the world's principal rubber consumer, he pointed to the present situation of Germany and the Central Powers as proving that rubber is a military necessity and demonstrating the awkwardness of being without an adequate supply in time of war. Mr. Taft then reviewed the principal sources of crude rubber, touched briefly upon American enterprise in the ownership and maintenance of rubber plantations in the Dutch East Indies and elsewhere, and emphasized the possibilities of the tropical and semi-tropical areas within our national jurisdiction. Our agricultural authorities, he said, should be awake in their researches to investigate the feasibility of raising rubber in Texas and in those regions of the United States which resemble Mexico in climate and physical conditions. Mention of the guayule industry and its interruption by the deplorable conditions of anarchy now existing in Mexico brought him to a consideration of our foreign policy with respect to the protection of Americans carrying on industries abroad, and to quote Chief Justice Marshall of the Supreme Court and Mr. Justice Miller as to the manifest constitutional rights of American citizens, both individually and in bodies constituting corporations. Continuing he said in part:

Of course some injustice done to our people in other countries may not be of sufficient importance to justify our going to war. It must always be a matter of degree in resorting to such extreme measures. But it will be a fatal injury to our American enterprise and to the great usefulness of foreign investments by our citizens if it is to be understood that we will never resort to extreme measures in discharging the constitutional duty of this country towards its citizens when in foreign lands, and in protecting them against the unlawful invasion of lawless foreign government. And you gentlemen, interested as many of you are, in the industry of producing crude rubber in various foreign countries, in some of which the governments are not the most able, are certainly greatly interested in the maintenance of the constitutional protection of our citizens abroad.

But we have tropical countries of our own in which rubber can be raised. Rubber is produced in some quantity in the Philippines. I was greatly interested in the subject when I was connected with the Government of Rhode Island, but unfortunately the policy of Congress, which we as a commission protested against, has very seriously interfered with the development of the industry there. Oppressed as Congress was by the popular fear of the power and monopoly of great corporations in this country, it allowed itself to be frightened into a policy in the Philippines that has worked greatly to the detriment of their

people, to the detriment of this country, and increasing the trade of those islands. The limitation contained in the fundamental act of the Philippines forbidding the acquisition of land by foreign corporations of more than 2,500 acres is an absurdity in a tropical country where sugar, rubber and other tropical products should be encouraged. The risks connected with tropical enterprises of that kind are very great. Everyone who is familiar with their working will appreciate the maxim that in five years of operation you have two bad years, one moderate year, and two good years, and that the destruction of bad years in the tropics is in proportion to the greater violence of natural forces in the tropics than in the temperate zone. The amount of land which ought to be cultivated in the Philippines as compared with the amount that is cultivated is so great that the acquisition of parts of it by great corporations could work no evil at all. It is a mere hobgoblin created by dangers of this country which find no counterpart in a retarded country like the Philippines. We did for 12 or 15 years make great progress in the Philippines in many ways, but we might have made a great deal more progress in helping the people to better industrial conditions had we had the assistance of the capital which was available in the United States, and which adverse legislation kept out of those islands. I am very proud of the work which we did for



WM. H. TAFT.

15 years in giving them a good government and in bringing about a condition of prosperity there; in giving half of their school population an opportunity for an education; in giving them law and order; in giving them good roads; in giving them a good currency; in giving them a good administration of justice; in giving them good health. But all these things were made possible by the building up by a great civil service guided and strengthened by a body of Americans the like of which, I think we have never had in our government before. The present policy in the Philippines has been to drive out of the service of the Philippine Government, all those American civil servants; and we have turned the Islands over to Filipino politicians and to a control that, after the impulse of a good government which they

have had shall be exhausted, will result in efficiency and corruption and produce a discontent that will ultimately plague us, responsible as we are for the welfare of the Philippine people. It will create a political situation in which bribery and blackmail will become a feature in every great business projected there. It will make investments of capital less likely and will help neither the people of the Islands nor the business of the country. These are the reasons why the rubber industry has not flourished in the Philippines. I wish it could have been otherwise.

I felicitate the Rubber Club of America on the enterprise that Americans have shown in hunting opportunities for the growth of rubber, and in the increase in the rubber industry. I sincerely hope that it may not be injured by any ill-conceived system of taxation upon crude rubber, which will put our manufacture at a disadvantage with the manufacturers of the world in competition in the sale of rubber goods. I sincerely hope that the utterly illogical process of reducing the duty on manufactured goods and increasing the duty on the raw material entering into them will not be further pursued in our economic policies. The theory that rubber is a luxury is of course not true. When it was proposed to tax automobiles on the theory that they were luxuries, investigation satisfied the proposers that they had grown to be necessities, and with them, of course, the rubber tires that are essential to their use. I hope the lesson which was then learned will be remembered, and that the enormous industry which you represent will be made to pay its taxes in proportion to your profits and your wealth, but not in such an injurious way as to hamper your competition and productive powers to be used not only for your own reasonable and legitimate profit, but for the benefit of the people of the United States.

SAMUEL MACROBERTS ON OUR FUTURE PROBLEMS.

Samuel MacRoberts, vice-president of the National City Bank of New York in charge of all its foreign interests, spoke in the absence of Frank A. Vanderlip because of illness and was introduced by President Firestone as a man to whom the rubber industry is indebted for the establishment of the gold dollar of

the Far East. Mr. MacRoberts pointed out that the problems of the rubber industry are very much the problems of the entire industrial life of the nation. As a result of two years of exceptional plant expansion and prosperity, the outstanding fact of our economical relation to the world is the sudden accumulation by this country of a large additional capital. What this means to our own country and to other nations has not yet crystallized into any definite thought, although various judgments are being hazarded; and whether we agree with any one of them, Mr. MacRoberts believes it plain that the question is not only pregnant with business disaster, but that it has the lure of very great opportunities. Developing this line of thought he sounded a wholesome warning, extracts from which follow:

The fact that the cost of production in this country has steadily risen to unparalleled heights, the unparalleled level of wages, and the resultant high cost of living, all indicates the difficulties that might come to us through this unusual condition. It indicates how easily this situation might be reversed, and this newly acquired wealth drawn away at the close of the war, leaving only the dregs of a discontent and innumerable difficulties of a political and economic nature. Our industry has already expanded, possibly expanded to the limit of our labor market to operate, and if we are to continue to accumulate gold, this labor situation will prevent our investing it in legitimate industrial enterprises. A further accumulation will only result in an expansion of bank credit which we cannot use in our domestic situation.

This is a situation that is recognized by the Scandinavian countries, and is the reason why they have so strenuously discouraged the further importation of gold into their countries. Even if we are ambitious only to hold this gold, we cannot do it unless we can incorporate it promptly into the commercial business of the world.

The optimistic conclusion that New York is to be the financial center of the world, and that the keys of the commerce of the world are already in our hands is clearly untenable, and it is a dangerous tendency for us to drop into the theory that we

have become in the natural order of things a great trading nation, and that our economic position is protected and secured for the future. In real fact we bring to the situation of being a great trading nation only one element, that is, this newly acquired wealth—money. Our geographical position is distinctly against it. We are outside of the lines of trade and commerce. We have no shipping facilities. We even seem to ignore the ordinary economic principles that are necessary to found them. We have not a sufficient number of international banks or other machinery for financing a foreign trade. We prohibit the establishment of foreign banks here, which is just as necessary for maintaining a great international trading position as it is for us to establish our branches in foreign lands.

We have few men with any knowledge of foreign trade or international commerce. Our laws have been drafted with a sole eye for a domestic situation and with no regard either for our opportunities or for our necessities abroad. As a nation we have a provincial point of view on all these matters, and until we can develop a settled public opinion which, after all, controls our government, we will have a weak and unstable government to look to for protection.

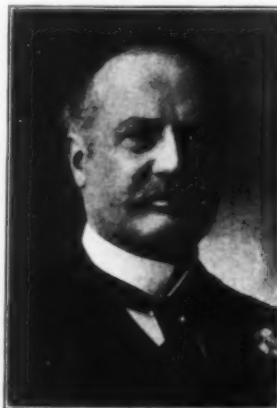
Now, getting back to the rubber industry, your situation is just the same. You have the same elements in your situation as is in the general industrial life of the country. Where are you going to be to meet your competition when competition is restored, for after all, this great period of prosperity comes directly or indirectly from these abnormal conditions. In international finance the maxim is that the trade follows the loan. Now, with you it is not a question of whether or not you are to make loans, but whether you will make investments in foreign countries to protect your raw materials, to make your supply of raw materials sure, and at a price which is not unequal to that of your competitors abroad. You have exactly the same

problems that the whole country has, and it is to be hoped that the Rubber Association in looking after its own interests will not overlook these problems that apply to the entire country.

COLONEL COLT REVIEWS RUBBER HISTORY.

Introduced by President Firestone as the dean of the rubber industry, a manufacturer who had made American influence felt in foreign countries, and the pioneer whose courage and foresight had brought us nearer the source of supply by leading the way safely and wisely for American capital in the production of plantation rubber, Colonel Samuel P. Colt reviewed the highlights of rubber history in his own genial manner interspersed

with much wholesome humor. Placing rubber as the second of the three greatest forces of civilization to-day, the first and third being steel and cement, he reviewed its source, the origin of its name, early experiments in its use, the discovery of vulcanization and the manifold applications made possible thereby. In illustration of the mighty consequences of Goodyear's epoch-making achievement, Mr. Colt pointed to the pneumatic tire which has revolutionized the world. And said he:



COLONEL S. P. COLT.

I believe if the automobile had been perfected, and the rubber pneumatic tire had been perfected, and the solid tire on the auto truck had been perfected twenty years before any railroad had been built, there would not have been one-half, nor one-quarter, nor perhaps one-tenth of the railroads that there are to-day. But what would we have had in its stead? We would have had the most magnificent roads; we would have gone back to the days of the stage coach magnified, and we would have had the most magnificent roads throughout this country that the world ever knew, surpassing even those of Rome. But the railroad was first, and the railroads are built, and it is going to take time to build the roads, but I say now that the automobile and the automobile truck are going to encroach daily upon the railroads, and for short hauls are going to very largely supersede them, and our roads are going to improve, and you are interested in this great object, Mr. President, of the Lincoln Highway from the Atlantic to the Pacific Coast. I do not believe we can over-estimate to-day the part that rubber is to play in the civilization of the world in the future, and I do not believe that there will be any substitute for the rubber pneumatic tire. I do not know why the Almighty should have given such a product as rubber to the world, but He did, and they have tried to imitate it, they have tried for synthetic rubber, they have tried all things, but there is nothing found to take its place.

Mr. Colt then referred to the high rubber prices prevailing within four years and to the fact that the vision of those who experimented in transplanting the *Hevea* from the banks of the Amazon to the propitious soil and climate of the Far East had developed an inexhaustible supply that is already providing three-fourths of our need at a moderate price. In closing he emphasized the great present need of coöperation in the industry, quoting former Chairman Hurley of the Federal Trade Commission to the effect that coöperation as opposed to ignorant competition is the watchword of the era we are entering—coöperation between employer and employe, among business men, and between business and government.

Mr. Firestone then said:

It is a little late, gentlemen, but you may be interested—with no reflection on the rubber industry, you should be interested in what the next speaker may say to you. In Ohio we not only build factories and prepare presidents for the White House, but we look after the finer sensibilities for this country, while we are here, and for the next world we don't want to take any chances. We are not selfish with that influence—we have



Courtesy of the Co-operative Press.
S. MACROBERTS.

brought a Bishop from Ohio. He is a man who is responsible for my well-being in the paths that I walk, and some other rubber men that I know. Whether he has fulfilled that responsibility it is up to you gentlemen to judge. Before bringing him down here, we didn't take any chances—I spent my vacation with him, and he lives second door to a rubber president, and we concluded that we would like to have him spread the influence among our friends. I am sure you will be interested in hearing from my friend and bishop, Frank DuMoulin.

BISHOP DU MOULIN ON AMERICA'S ETHICAL OPPORTUNITIES.

Genial Bishop DuMoulin, whose beneficent influence has found such generous expression in the welfare work of the rubber factories of Ohio, spoke with earnestness and enthusiasm in appreciation of the importance of the finer sensibilities in business and social relations. Four types of men represent about all there is of life to-day, according to Bishop DuMoulin, the commercial man, the teacher, the ethical man—ever growing more important in this humanitarian age—and the prophet. The viewpoints, achievements and shortcomings of each in their relations one to another he pictured convincingly, and then in the rôle of both prophet and ethical man he pictured brilliantly the wonderful opportunities for progress in every line of human endeavor. Said he in conclusion:



BISHOP DU MOULIN.

It is a mark of the age that a minister, a weak-kneed, effeminate, anaemic minister, if you please, should be allowed to sit at this board with ex-presidents and kings of finance as they discuss the merits of the greatest factor and element in all the world's history, and that he should be allowed to make his contribution to a symposium of the character in which we have all joined tonight. It is because men consciously or unconsciously are getting down to the roots of things, are getting down to the fundamental bases upon which the whole of life is structured and upbuilt and developed. * * * You and I are living in an age which will be looked upon, when the history of life is written, as being the greatest transitional age the world has ever seen. There is not the element of finality about this age; there is not a single atom of completeness about it; it is a contradictory age; it is an introductory age; it is an age of expediency; the human race is forward bound, its hope is in the future, its golden age has yet to come; it is in the vanguard of things; it is looking forward as it never looked forward before, save in one period of three years, in all its far-reaching history. Why, the world has reached that adolescent period in its history, in its development, which constitute it the mightiest opportunity for the men who live in it that has ever been given to any generation of the sons of man. Because we have reached the heir of the ages, we have reached that time that we may well call the nick of time, the strategic era, the pivotal point in the world's history, when every act of morality and truth and self-sacrifice and goodness to-day will be worth a hundred later on, just as it is worth a hundred of anything that has gone. You and I have the privilege of living in the mightiest epoch of human affairs that history has ever recorded or men have ever known; that accounts for its confusions, its upheavals, its cataclysmic and almost unbelievable desires, because the whole world is in influx, is in process, is forward-bound, is in its birth pangs of suffering and blood; and there is a brighter day upon us. As we stand on this threshold age, the eastern sky is streaked with the crimson of the morning sun of a new day, created by the blood-red banners that spell progress and happiness and achievement for our humanity, and may a beneficent Creator who has given us the privilege of living at this epoch in human affairs, give us such sense of responsibility in our commerce, and our education and our ethics, that we may be fitted to the age in which we live, that we may to the full realize the maximum of progress, that we may gain the largest dividend of human welfare and achievement, until the knowledge of truth, of God, and all that is best in life, shall cover this wide world as the very waters cover the sea.

THE MEMBERS AND GUESTS PRESENT.

AT THE PRESIDENT'S TABLE.

Appleton, Francis H.	Hodgman, George B.
Bourn, Hon. A. O.	MacRoberts, Samuel
Clifton, Col. Chas.	Malone, Dudley Field
Cole, W. T.	Perez, Ernesto C.
Colt, Hon. Le Baron B.	Pinheiro, H. C. de Martins
Colt, Col. Samuel P.	Taft, Hon. William Howard
Du Moulin, Rt. Rev. Frank	Voorhees, John J.
Firestone, Harvey S.	

ALPHABETICAL LIST.

A	Burnett, Aaron
Abbott, J. M.	Burr, A. E.
Achelis, F. G.	Burrage, H. L.
Adams, H. J.	Burrill, W. S.
Aldrich, Edward B.	Rutler, O.
Altschuler, A. A.	Byles, L. M.
Andersen, E. A.	Byrne, F. L.
Anderson, J. D.	
Andrews, Don E.	C
Appleton, Edwin J.	Caldwell, J. C.
Appleton, Lloyd E.	Caldwell, R. J.
Armitage, J. D.	Campbell, C. E.
Armstrong, H. G.	Campbell, Phillip H.
Arnold, W. H.	Candee, C. N.
Arthur, Geo. D.	Candee, W. L.
Ashcroft, R. W.	Carberry, John D.
Austin, F. G.	Carkhuff, S. G.
Ayer, P. P.	Carlisle, C. H.
	Carlton, C. C.
B	Carnahan, G. H.
Babcock, F. Huntington	Carroll, J. M. S.
Babcox, E. S.	Cartmell, Van H.
Badenhop, Robert	Case, C. C.
Bailey, S. R.	Casey, J. J.
Baird, Collier W.	Cast, J. F.
Baird, H. W.	Cattle, Geo. T.
Baird, Robert L.	Chadwick, W. H.
Baird, William T.	Chadbourne, Joseph
Baldwin, S. D.	Chandler, J. J.
Ballou, Roland H.	Chichester, Ira
Ballou, Walter S.	Chilcote, Samuel S. C.
Barker, Wm. E.	Chipman, R. L.
Barnard, Harold H.	Clark, Mr.
Barnard, O. A.	Clark, M. H.
Barnes, C. W.	Clark, S. H.
Barton, B. W.	Clemens, James
Bass, W. F.	Clements, James
Bass, W. H.	Clements, Dr. R. L.
Bassett, T. W.	Cobb, J. H.
Basten, Otto	Cobbell, H. R.
Bates, Charles Austin	Colt, Roswell C.
Beal, H. L.	Conant, Richard G.
Bedell, Harold H.	Cone, Charles A.
Behrens, Henry	Cone, Frederick H.
Belcher, Edwin W.	Cone, John
Bers, Aaron	Conlin, A. J.
Bers, Edward	Cook, C. S.
Berrien, W. P.	Cook, Mortimer M.
Besaw, Charles A.	Cornell, A. B.
Birkenstein, Louis	Cory, Robert H.
Bishop, Erle A.	Couch, C. A.
Blackwell, Wilson H.	Coughlin, E. J.
Blanchard, F. C.	Coughlin, T. B.
Blanchard, J. C., Jr.	Covell, George F.
Blandin, Victor C.	Cowen, R. R.
Blatt, H. D.	Cowenhoven, C. S.
Bourn, Lyman M.	Craven, B.
Brandes, C. O.	Cramer, M. L.
Brewster, L. O.	Crowley, John T.
Brinckerhoff, E. A.	Cummings, E. O.
Broadwell, E. H.	Cummings, H. H.
Brodhead, Garrett, Jr.	Cummings, W. L.
Broughton, J. S.	Curtis, F. L.
Brown, Andrew H.	Cutler, David A.
Brown, A. H.	Cutter, W. O.
Brown, J. Stuart	
Bruyn, W. E.	D
Buckleton, E. E.	Daggett, H. A.
Budlong, M. J.	Daniel, C. A.
Burley, H. B.	Dannerth, Frederic

Davis, Edgar B.
 Davol, Chas. J.
 DeLanie, H. J.
 De le Graze, Capt.
 DeLisser, Horace
 DeLong, William A.
 Desmond, T. A.
 Devine, Jas. W.
 Dewing, Eben F.
 Dickerson, Geo. B.
 Dickerson, W. H.
 Dodd, Samuel H.
 Donaldson, Wm.
 Dorr, Roy L.
 Doucette, W. M.
 Dowse, Byron C.
 Drake, R. E.
 Drayton, Judson
 Drisler, W. Arthur
 Dryden, Geo. B.
 Duffy, L. A.
 Dugan, Walter J.
 Dumont, L. W.
 Dunbar, E. W.
 Dunbar, F. L.
 Dunbar, F. W.
 Dunbar, J. Frank
 Dunbar, J. Frank, Jr.
 Dunn, H. T.
 Dunn, W. H.
 Dunsford, S.
 DuPuy, H. W.
 Duryea, A. R.

E

Eagles, R. P. M.
 Earle, W. P.
 Elbogen, Paul

F

Fairbank, L. G.
 Farson, John
 Fay, E. E.
 Feinburg, David
 Fera, Henry, Jr.
 Ferguson, Irving B.
 Field, H. E.
 Firestone, Harvey S., Jr.
 Firestone, R. J.
 Fisher, Myron L.
 Fisher, R. L.
 Fisk, H. G.
 Flach, G.
 Flint, Dr. A. W.
 Fogel, T. C.
 Foote, R. F.
 Fox, Frank F.
 Francis, Arnold W.
 French, H. W.
 Freshman, Chas.
 Frissell, F. H.
 Fulkert, Charles
 Fuller, H. P.
 Fulper, E. B.

G

Galt, W. H.
 Gardner, George A.
 Gardner, Thos. M.
 Garretson, C. D.
 Garthwaite, A. A.
 Geddes, Mr.
 Gehring, C.
 Georger, F. P.
 Gerhold, C. H.
 Gibbs, B. S.
 Giles, Jas. F.
 Glaenger, G. B.
 Glidden, Alfred A.
 Glynn, F. V.
 Goodwin, Leonard
 Gould, M. P.
 Gove, F. G.

Green, H. M.
 Greene, Bartlett
 Greene, N. Lincoln
 Greene, W. E.
 Greenough, A. B.
 Grennor, John, Jr.
 Grieb, William G.
 Grosscup, P. S.
 Growtage, W. B.
 Gunlock, Wm. M.
 Gunn, J. Newton
 Gustin, A. D.

H

Haaker, E. A.
 Hagemeyer, A. H.
 Haines, Wm. M.
 Haldane, D. D.
 Hall, Geo. E.
 Hamilton, R. S.
 Hammar, John
 Hammesfahr, W.
 Handy, J. L.
 Harding, F. H.
 Hardy, A. S.
 Hardy, R. S.
 Harlow, Robert C.
 Harriman, Joseph W.
 Harris, A. C. Spencer
 Harris, Roy G.
 Harrison, Clark W.
 Harrison, O. M.
 Hastings, A. Abbott
 Hatch, T. E.
 Hathorne, E. J.
 Haws, H. E.
 Hayes, Alfred
 Haynes, C. R.
 Heitzmann, C.
 Henderson, B. W.
 Henderson, F. B.
 Henderson, Francis R.
 Henry, D. E.
 Hering, Henry F.
 Herron, John
 Hewins, E. D.
 Hillen, Paul
 Himebaugh, L. C.
 Hodges, Geo. W.
 Hodgman, S. T.
 Hoffstaedter, Hugo
 Holcomb, C. H.
 Holcomb, F. E.
 Holcombe, H. W.
 Holmes, C. H.
 Hood, Frederic C.
 Hopkinson, E. B.
 Hopkinson, Ernest
 Hopper, Chas. C.
 Horn, F. H.
 Hotchkiss, H. Stuart
 Houk, H. G.
 Hubbard, H. B.
 Huber, Edward E.
 Hughson, Wm. F.
 Hutton, Wallace C.
 Huxley, E. H.
 Hydes, Thomas

J

Jacoby, Ernest
 Jamieson, R. E.
 Jenckes, F. L.
 Jenkins, H. W.
 Jenks, Walter H.
 Johnson, Allen F.
 Johnson, Stuart H.
 Johnston, W. A.
 Johnstone, James T.
 Jones, A. B.
 Jones, Frederick H.
 Jones, W. O.

K

Kaufmann, C. B.
 Kaufman, M. B.
 Kavenagh, W. E.
 Kearns, John
 Keeler, L. V.
 Kelly, J. H.
 Kelly, W. J.
 Kelly, Dr. W. J.
 Kendall, J. A.
 Kennedy, David G.
 Kent, W. J.
 Kenyon, C., Jr.
 Kenyon, George
 Kenyon, H. L.
 Kies, W. S.
 Kimball, Thomas F.
 Kittle, F. L.
 Klingsmith, F. A.
 Kniffen, C. E.
 Knoke, E. J.
 Koffman, J.
 Kubie, David S.
 Kubie, Samuel
 Kugler, H. W.
 Kurvy, J. A.
 Kush, Gustave

L

Lahey, F. T.
 Lambert, J. A.
 Lamont, Sloan, Jr.
 La Motte, F., Jr.
 Laurie, Mr.
 Learned, J. H.
 LePau, Louis N.
 Lewis, S. L.
 Lewis, T. S.
 L'Hommedieu, P. B.
 L'Hommedieu, S. Y.
 Linton, Ben B.
 Litchfield, P. W.
 Little, C. E.
 Littlejohn, Lomax
 Littlejohn, R. M.
 Lloyd, Prof. F. E.
 Loeb, Milton
 Loewenthal, R. M.
 Long, Albert
 Long, J. W.
 Louis, J.
 Low, C. H.
 Low, R. A.
 Lowe, George H.
 Lowman, J. S.
 Ludington, G. A.
 Lynah, Jas.
 Lynch, Chas.

Mc

McCallum, Fred
 McClaren, H. L.
 McConnell, R. M.
 McGuire, Thos.
 McKay, C. B.
 McKay, E. B.
 McKenna, Drew
 McKenna, F. R.
 McLean, Joseph F.
 McMaster, H. B.

M

MacKusick, H. A.
 MacMillan, John A.
 MacNamara, L. P.
 Macomb, J. W.
 Maltus, Wm. A.
 Manchester, A. A., Jr.
 Many, Robert
 Marcus, Mr.
 Marland, W. H.
 Marland, Wm. H.

Marsh, Howard L.
 Marshall, T. C.
 Martin, Bertram T.
 Martin, George W.
 Marvin, C. M.
 Mathewson, C. E.
 Maurer, E. J.
 Maus, John B.
 May, Dr. Calvin S.
 Mayer, Levy
 Mayo, Geo. H.
 Means, W. A.
 Measure, Charles
 Meyer, Adolph
 Meyer, Chas. A.
 Meyer, Otto
 Meyers, A. C.
 Meyers, Sidney S.
 Miles, Colonel D. E.
 Miller, C. E.
 Miller, H. C.
 Miller, I. L.
 Miller, J. A.
 Miller, J. Ernest
 Miller, T. W.
 Miller, Wm. B.
 Milne, Gordon
 Miner, Wm. H.
 Mitchel, J. K.
 Montgomery, Henry
 Montgomery, James M.
 Morehead, H. J.
 Morgan, Col.
 Morgan, John
 Morpeth, Wm. R.
 Morris, M. E.
 Morse, Wm. M.
 Muehlstein, Herman
 Muehlstein, Julius
 Murray, James A.
 Murray, James A., Jr.
 Myers, F. E.
 Myers, P. A.

N

Naylor, R. B.
 Norris, Samuel
 Norton, E. F.
 Newcombe, Richard N.
 Nichols, T. B.

O

Oakley, C. H.
 Odell, James E.
 Odell, L. G.
 Okane, J.
 Oliver, N. E.
 Osterloh, A. F.
 Owens, R. J.
 Ochschoen, I.
 Obalski, Xavier W.

P

Page, John E.
 Page, Wallace G.
 Parker, F. L.
 Parker, J. R.
 Parker, Russell
 Partridge, A. G.
 Pearce, H. E.
 Peaty, F. H.
 Pell, George E.
 Perlish, Henry
 Pfaff, Ed. F.
 Pfeifer, William
 Pharis, Carl
 Pingree, M. H.
 Pitcher, C. N.
 Pitcher, W. L.
 Place, Charles A.
 Plumb, L. J.
 Poel, Frank

Poole, William
Pratt, B. H.
Presbrey, Frank
Price, Percy B.
Price, R. B.
Proctor, Lawrence B.
Proctor, W. L.
Pusinelli, Fred

R

Raymond, H. E.
Rector, J. M.
Reddy, H. H.
Reed, Henry D.
Reed, W. Boardman
Reeve, Arthur
Reeves, George H.
Reynolds, F. I.
Replogle, H. H.
Rice, R. L.
Richards, T. G.
Rieder, F. H.
Rigdon, Walter D.
Robertson, J. G.
Roberts, Malcomb
Robinson, H. H.
Robinson, J. Thomas
Robinson, Thomas L.
Rockhill, L. C.
Rose, J. T.
Rosenblatt, Sam
Rousmaniere, J. E.
Royal, Joseph S.
Rutherford, W. O.
Ryckman, W. G.

S

Sachs, R. P.
Sawyer, A. M.
Sawyer, H. E.
Schaffer, F. F.
Scheren, G. Arthur
Schlosser, George
Schwab, F. N.
Schweinert, M. C.
Seiberling, F. A.
Semple, C. H.
Seward, A. M.
Shilts, W. D.
Shreve, J. Nelson
Simonson, W. A.
Simpson, R. W.
Sipp, John L.
Sisler, L. E.
Sloane, Charles
Slocum, Edward M.
Smith, F. Haskell
Smith, H. E.
Smith, Herbert E.
Smith, H. W.
Smith, Theodore E.
Smith, William B.
Smith, W. Richmond
Corrick, C. S.
Spadone, Amedee
Spadone, Henry
Speaks, C. E.
Spooner, Herbert T.
Stearns, E. W.
Stedman, A. W.
Stephens, William
Stern, Fred
Stiles, Lynn D.
Stiles, W. H.
Stimpson, Harold
Stokes, C. E.
Stone, J. Everett
Stowe, Griswold
Studebaker, C. D.
Swaney, C. R.
Sweeney, Edward C.
Sweeney, Edward C., Jr.

T

Tallman, A. V. W.
Taylor, M. C.
Tenney, John, Jr.
Terhune, Richard
Thalhimer, A. F.
Thomas, J. W.
Thomas, L. H.
Thomas, W. G.
Thompson, Kennedy M.
Thornton, A. D.
Thorstensen, C. E.
Tobin, H. B.
Tompkins, L. Douglas
Townsend, A. F.
Tucker, A. Y.
Turner, M. A.
Tweedy, O. S.
Tyke, A. T.

V

Van Alst, Milton
Vance, L. T.
Van Cleef, Felix
Van Derbeck, Frank H.
Van Emmerik, J. A.
Van Etten, J. de C.
Van Kleeck, Chester
Vaughn, L. A.
Vincent, R.
Voorhees, Frank D.
Voorhees, John J., Jr.
Vorhis, H. S.

W

Waldo, Frank
Walsh, Thos. F.
Walsh, Wm. C.
Wareham, Arthur
Warren, A. W.
Watkinson, George
Watson, John J., Jr.
Weber, Edward
Weber, Lothar E.
Weeks, P. S.
Weida, H.
Weitling, Wm. W.
Welton, Spencer
Weston, J. C.
Westren, J.
Whitehead, A.
Whitehead, Richard R.
Whitehead, Robert V.
Whitenack, W. A.
Whyte, J. A. E.
Wies, Geo. A.
Wildman, W. W.
Williams, E. S.
Willis, R. S.
Wilson, Dudley
Wilson, C. T.
Wilson, E. H.
Wilson, Henry C.
Wilson, W. E.
Wise, Paul F.
Wood, Charles E.
Wood, John R.
Wood, LeRoy
Wood, Theodore
Woodard, S. P.
Woodbury, R. B.
Woodward, K. D.
Work, B. G.
Wright, Saml.

Y

Young, C. T.
Young, Philip E.
Yule, W. H.

Z

Zeiss, Albert

RETIRING BOARD OF DIRECTORS' AND EXECUTIVE COMMITTEE MEETING.

THE retiring board of directors met at the Union League Club, New York City, January 6, at 12.30 P. M., and confirmed all the acts of the Executive Committee during the past year. It was decided to combine the Committee on Uniform Crude Rubber Contract with the Committee on Crude Rubber Nomenclature and under the former title. The directors passed a resolution recommending that the name, "The Rubber Club of America, Inc.," be changed to "The Rubber Association of America." It was resolved that in the future a member to be eligible to associate membership must be connected with a firm member. The directors voted that the association should be represented at the National Security League's Congress of Constructive Preparedness to be held in Washington, D. C., January 25-27. Amedee Spadone, Gutta Percha & Rubber Manufacturing Co., New York City, was the delegate appointed to represent the Rubber Club.

The Executive Committee then went into session and the following firm members were elected:

FIRM MEMBERS.

A. J. Bates & Co., Inc., New York City.—Representative, Frederick B. Nickel.

The Carter Bell Manufacturing Co., New York City.—Representative, W. H. Chichester.

Norwalk Tire & Rubber Co., Norwalk, Connecticut.—Representative, Dr. David Spence.

Hazen-Brown Co., Brockton, Massachusetts.—Representative, Max Brown, transferred from Associate Membership.

Panther Rubber Manufacturing Co., Stoughton, Massachusetts.—Representative, Frank Berenstein.

Manhasset Manufacturing Co., Providence, Rhode Island.—Representative, Roland H. Ballou, transferred from Associate Membership.

The Interocan Oil Co., New York City.—Representative, W. G. Thomas, Jr.

The Standard Tire & Rubber Manufacturing Co., Cleveland, Ohio.—Representative, M. J. Gillen.

Maguire Rubber Co., New York City.—Representative, J. B. Maguire.

Engene Doherty Rubber Works, Inc., Brooklyn, New York.—Representative, Philip A. Doherty.

Rubber Insulated Metals Corp., Plainfield, New Jersey.—Representative, Charles P. L. Huston.

Danversport Rubber Co., Boston, Massachusetts.—Representative, Frederic Barlow.

The H. F. Taintor Manufacturing Co., New York City.—Representative, Harry Taintor.

E. M. & F. Waldo, New York City.—Representative, Edward M. Waldo.

Frank B. Ross & Co., New York City.—Representative, Frank B. Ross.

C. L. Hawthaway & Sons, Inc., Boston, Massachusetts.—Representative, Clarence L. Hawthaway.

Jenckes Spinning Co., Pawtucket, Rhode Island.—Representative, F. L. Jenckes.

The Luzerne Rubber Co., Trenton, New Jersey.—Representative, Bruce Bedford or C. Dudley Wilson.

Monatiquot Rubber Works Co., South Braintree, Massachusetts.—Representative, Robert C. Harlow.

The applications for Associate Membership were laid on the table for consideration at the next meeting.

The Annual Meeting of the Rubber Club of America, Inc.

THE annual meeting of The Rubber Club of America, Inc., was held at 2:30 P. M., January 8, at the Waldorf-Astoria, New York City. After the reading of the minutes of the previous meeting, the reports of the officers, covering the club's many activities of the past year, were read and adopted.

SECRETARY'S REPORT.

Since our last annual meeting the firm membership of The Rubber Club of America, Inc., has increased to 231 firms in the rubber and allied industries, which is an increase of 20 per cent, and our associate membership has increased from 227 individuals connected with the rubber industry to 242.

During the eleven months covered by this report the executive committee has held five meetings and the board of directors has held one session. Numerous committee meetings have been held at the association headquarters, where the directors' room is always at the disposal of our membership and for meeting purposes.

The organization of several groups of manufacturers as divisions of The Rubber Club of America, Inc., is very gratifying, as is the affiliation of the Rubber Reclaimers' Club as a division.

The annual mid-summer outing was held for the second year at the Vesper Country Club at Lowell, Massachusetts, and the attendance was over 300, and over 125 more than at the outing the year previous. Special trains were run from Akron and New York, and the outing was voted the most enjoyable of any in the history of the association.

The banquet of 1916 was held at the Waldorf-Astoria on the evening following the annual meeting on February 2, 1916. The attendance was nearly 300, which was a substantial increase over the previous year.

Since our last annual meeting we have lost the following members by death:

Richard H. Linburg, president of the United and Globe Manufacturing Cos., died at Trenton, New Jersey, January 5, 1916.

William Lyall, president of The Brighton Mills, Passaic, New Jersey, died in New York City January 13, 1916.

Charles Henry Arnold, of Arnold & Zeiss, died in New York City February 20, 1916.

John Hopewell, former president of The Reading Rubber Manufacturing Co., died at Washington, D. C., March 28, 1916.

George David Hazen, of The Hazen Brown Co., died at Brockton, Massachusetts, April 13, 1916.

Le Baron C. Colt, vice-president and general manager of The National India Rubber Co., died at Bristol, Rhode Island, May 25, 1916.

F. C. Breakspear, with A. G. Spalding & Bros. Manufacturing Co., Chicopee, Massachusetts, died at New York City, June 2, 1916.

James H. Seiberling, president and general manager of The Indiana Rubber & Insulated Wire Co., died at Jonesboro, Indiana, July 7, 1916.

Robert J. Bowes, with the Lawrence Felting Co., died at Millville, Massachusetts, on September 11, 1916.

Paul Schmidt, secretary of the Rubber & Guayule Agency, Inc., died at Englewood, New Jersey, on September 13, 1916.

Philip Braender, president of the Braender Tire & Rubber Co., died at White Plains, New York, November 4, 1916.

John Henry Flint, president of the Tyer Rubber Co., president of the New England Rubber Club, 1905-1906, and director, 1902-1905, 1905-1916, died at Andover, Massachusetts, on November 29, 1916.

Consideration of the reports of four special committees was then taken up.

A UNIFORM CRUDE RUBBER CONTRACT.

First came that of the Committee on a Uniform Crude Rubber Contract, H. Stuart Hotchkiss, chairman. As the result of long deliberation, a set of rules for the regulation of the traffic in crude rubber had been previously submitted to the membership by mail for study, and was then discussed paragraph by para-

graph and finally adopted as reprinted below, subject to later amendments by the Executive Committee if found necessary or desirable. By this action the Club did not take the position of discouraging special contracts between manufacturers and dealers, the idea being to provide a workable standard of rules and definitions to govern in all cases where rubber is sold "under the rules of The Rubber Club of America, Inc." It is the belief of the Committee that the interests of the manufacturer, the importer and dealer have been protected. The revised and adopted draft follows:

RULES.

All sales purporting to be made subject to the rules of The Rubber Club of America, Inc., shall be considered as made subject to the following rules:

1. STANDARD QUALITIES. Standard qualities consist of the following:

(a) *Hevea* First Crêpe

Hevea Ribbed Smoked Sheets

Hevea Plain or Smooth Smoked Sheets and/or Biscuits

Hevea Unsmoked Sheets and/or Biscuits

to be understood as per standard samples on file with The Rubber Club of America, Inc., at New York and at Akron, Ohio, said samples to be renewed at least once every six months.

Para Standards—to be as understood in New York.

(b) Other qualities—to be as described in sales contract.

2. OTHER QUALITIES. Where a parcel of rubber is sold under one of the standard descriptions or under a description superior to the standard for a definite shipment, arrival, delivery, or on the spot, and is found inferior in whole or in part, the buyer shall have the option of rejection and the quantity so rejected, whether the whole or any portion, shall not constitute a delivery on the contract. Should the time for delivery have expired the seller shall have ten days to replace the quantity rejected at the original point of arrival or delivery in the United States of America or at the port of New York, provided that such quantity was in the opinion of the arbitrators a bona fide tender against the contract. In case the seller does not replace, the buyer at his option may cancel the contract, or buy and charge the difference, if any, to the seller.

3. Where a parcel of rubber is sold with a description of quality inferior to that specified in Rule 1, Section A, and upon delivery is found inferior in whole or in part, then the buyer must accept the same with allowance, provided such allowance in the opinion of the arbitrators, be not more than two cents per pound on the inferior portion; but should the parcel, in whole or in part, be rejected, the seller shall substitute proper quality to fulfil his contract at the original point of delivery in the United States of America or Canada or at the Port of New York within ten days from the time of rejection or within the time for delivery as the case may be. In case the seller does not replace, the buyer at his option may cancel the contract, or buy and charge the difference, if any, to the seller.

4. The word "Ton" shall mean a ton of 2,240 pounds.

5. DELIVERY WEIGHTS. Final delivery on any contract to be within 100 pounds of the weight contracted for, but in any case the nearest weight of the contract quantity that the average weight of the packages of the final tender admits. But where it is found impossible to deliver within 100 pounds, taking the average weight of the packages tendered, any deficiency or excess, shall be invoiced or invoiced back, as the case may be, at the market price on the date of delivery. Should buyer and seller fail to agree on the market valuation at such time, same is to be fixed, without fee, by the Arbitration Committee.

6. The words "about," or "more or less," when used to define quantities contracted for, shall mean the nearest amount which seller can fairly and reasonably deliver, but no excess or deficiency shall be greater than 2½ per cent. This rule shall apply only on specific lots.

7. DECLARATION OF VESSELS. After declaration, should the vessel, or vessels, carrying any portion of a contract calling for shipment or arrival be lost, such contract is to be cancelled to the extent of the goods lost.

Should the shipment not be declared by the seller prior to the loss of the vessel carrying the shipment, such loss shall not vitiate the contract or any part thereof.

8. **PROMPT SHIPMENT.** The term "prompt shipment" from foreign ports shall, under normal conditions, be considered as follows:

Within a period of—

Fifteen days, if shipped from Great Britain or Europe.

Thirty days, if shipped from the Far East.

Thirty days, if shipped from the Amazon Valley.

9. **CHECKING WEIGHTS AND APPROVING QUALITIES.** The buyer shall have the option of having his representative at the dock or warehouse to check the weights or to pass upon the quality. In the event that weights or quality are approved the responsibility of the seller ceases in respect to said weights or quality.

In event buyer does not exercise this option, actual gross weights with proper tare allowance "ex dock" or "ex store" at port of arrival shall govern weights and point of delivery in the fulfillment of a contract.

10. **SELLER'S RESPONSIBILITY.** In the event of the seller making shipment direct to the buyer, then the seller's responsibility for the safety of the goods does not cease until the goods are delivered to the transportation company or its agents. Should buyer designate an agent or representative to take delivery, seller's responsibility ceases when delivery order is in the possession of said agent or representative and goods have passed the weighmaster's scales.

11. **WEIGHING AND TARING.** Unless otherwise stated in the contract, all tenders of plantation rubber or rubber in bales, may be weighed in drafts at the option of the seller. Rubber shall be weighed gross to the 1 pound, if in drafts, and shall be weighed to the $\frac{1}{2}$ pound, if weighed by the package. Cases tared shall be weighed to the $\frac{1}{2}$ pound. Paras shall be grossed and tared case by case to 1 pound. All other grades of rubber which cannot be readily tared are to be billed at tares guaranteed by seller.

12. **MONTHLY DELIVERY CONTRACT.** Where a contract calls for monthly delivery, arrival or shipment, each month's or specified part of a month's delivery or shipment is to be treated as a separate contract.

13. **OPTION OF DELIVERIES.** Where rubber is sold for shipment from a foreign port, the seller may tender in fulfillment of the contract rubber not coming from that port, provided it is of the same description and quality as the rubber named in the contract and is tendered according to the terms of the contract so far as the time and place of delivery are concerned.

14. **NOTIFICATION OF REJECTIONS.** If acceptance of any parcel of rubber is refused by a buyer, notification must be given the seller in writing within seven days after receipt in the buyer's factory, stating specific reasons for such rejection. In case of claims or rejection rubber shall remain in original cases pending final determination.

15. **SPECIAL AGREEMENTS.** Any special agreement expressed in a contract supersedes any of these rules to the extent the rule is affected thereby.

16. **FAILURE TO FULFIL CONTRACT.** Whenever it may be admitted by the seller or decided by arbitration that the seller has failed to fulfil the terms of a contract then the buyer may, at his option, cancel the contract, or purchase quality called for in the open market charging the difference, if any, to the seller.

Whenever it may be admitted by the buyer or decided by arbitration that the buyer has failed to fulfil the terms of a contract, then the seller shall be released from all obligations connected thereto, and buyer shall be responsible for any loss occasioned by said failure.

17. **GOVERNMENT TAXES.** On contract for future delivery any import duty or tax imposed by the United States Government on crude rubber shall be for the account of the buyer.

18. **GUARANTEE OF SHRINKAGE.** When the rubber is sold on a guaranteed shrinkage in washing and drying, buyer must render the outturn to the seller within three months from the time of delivery.

19. **PLACE OF DELIVERY.** It is understood that when goods are sold "ex dock" or "ex store New York," the point of delivery shall mean the Port of New York.

20. **MISCELLANEOUS.** A contract calling "for delivery" shall be construed to mean that the rubber shall be weighed and ready for shipment or tender to the buyer during the period stipulated in the contract.

A contract calling "for arrival" during a certain period shall be construed to mean that it shall arrive upon a vessel due at the port named during the time stipulated in the contract and is to be tendered or shipped as soon thereafter as conditions permit.

A contract calling for shipment from a certain country or countries or a specified foreign port during a certain period or periods shall be construed to mean that the date of the bill of lading at

the port of shipment covering such goods called for in the contract shall be within the time stipulated for shipment.

21. **ARBITRATION.** All disputes between buyer and seller are to be settled by arbitration by the arbitrators of The Rubber Club of America, Inc., the award of the arbitrators to be final.

REPORT OF THE PREPAREDNESS COMMITTEE.

Tremendous changes in international and national events bring up the question whether our industrial organizations cannot play a much broader and more useful part than has generally been done in the past. It is difficult at this distance to appreciate the progress made in Europe toward combination of effort and resources in individual industries, as well as among industries, all of which is being hastened and directed by the government. This movement is likely to continue and develop long after the war, and much of its incentive is based upon American competition. Manufacturers are burying their antagonisms of long standing and cooperating with each other to a degree astonishing to one acquainted with British conservatism of the past.

The national council of defense and the national research committee are laying out very comprehensive plans with similar tendencies for this country. The Rubber Club has a remarkable opportunity to display leadership in the mobilization of our industrial resources and in the developing of that high type of cooperation, which will become more and more essential as these movements progress. For instance, it has already been brought to the attention of Washington that the entire rubber industry would be crippled in the event of hostilities with any important maritime nation, and probably the research committee will recommend that research work be carried on in connection with either synthetic rubber or the development of a supply of natural rubber within our own borders. This latter problem looks more difficult than the former, but, considering the absolute dependence of the rubber industry upon its supply of basic material, is it not the part of good business to have the industry undertake to insure that supply by the best means that our scientific men can point out? Why not have the Rubber Club appoint a committee of representative technical men within the industry to cooperate with the research committee and lay plans for the carrying on of research work by the industry if that appears to be the best plan? Starting with rubber, many other problems will come to mind, which could far better be investigated by the industry than by individual manufacturers. The automobile people have shown the world the advantage of unselfish cooperation, and the rubber industry perhaps represents the opposite extreme.

I should like to suggest, therefore, that the existing preparedness committee be discharged at the coming annual meeting, and that the directors of the Rubber Club organize among their active members a group to make this general problem an important operating feature of the Rubber Club. An industry that is capable of indefinite expansion, as the rubber industry is, will probably do more for its individual members upon a cooperative than upon an extremely competitive basis. Not only that, but the tendency of the world will force us in this direction in spite of ourselves. So is it not the part of intelligent business men to lead rather than be driven in the right direction?

In accordance with the suggestion of R. B. Price, chairman of the Preparedness Committee, contained in his report read by the secretary in Mr. Price's absence, this committee was discharged and its recommendations referred to the Executive Committee with power to take such action as may be deemed wise. In this connection President Firestone pointed out the desirability of a Committee on Research to work out the technicalities in the development of rubber growing and synthetic rubber, and anything that pertains to the development and betterment of the rubber industry.

THE LEGISLATIVE COMMITTEE IS HEARD FROM.

Frederic C. Hood, chairman of the Legislative Committee, had prepared no report, but addressed the members upon the important work that ought to be undertaken. He emphasized the importance of gathering facts and their proper presentation to governmental committees, pointed out the shortcomings of the average business man as an orator, and stated emphatically that such problems as the proposed import duty on crude rubber and the National Workmen's Compensation Act demand the attention of a legislative committee in which the utmost confidence is reposed and which will be accorded the full support of the Club.

NEW DIRECTORS ARE ELECTED.

Unanimously approving the recommendation of the Committee on Nominations, Homer E. Sawyer, chairman, the following board of directors was elected for the ensuing year:

William E. Bruyn, L. Littlejohn & Co., New York City.

Van H. Cartmell, Kelly-Springfield Tire Co., New York City.

Harvey S. Firestone, Firestone Tire & Rubber Co., Akron, Ohio.

H. Stuart Hotchkiss, United States Rubber Co. System, New York City.

William J. Kelly, Arnold & Zeiss, New York City.

P. W. Litchfield, Goodyear Tire & Rubber Co., Akron, Ohio.

J. S. Lowman, Philadelphia Rubber Works Co., Akron, Ohio.

W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio.

Charles T. Wilson, Charles T. Wilson Co., Inc., New York City.

Tracy S. Lewis, Beacon Falls Rubber Shoe Co., Beacon Falls, Conn.

John A. Lambert, Acme Rubber Manufacturing Co., Trenton, New Jersey.

Charles A. Daniel, Quaker City Rubber Co., Philadelphia, Pennsylvania.

AMENDMENTS TO THE CONSTITUTION AND BY-LAWS.

The proposed amendment to Article VI, Section 2, of the Constitution and By-Laws, a draft of which had previously been submitted to the membership, was unanimously adopted. It



J. A. LAMBERT.



T. S. LEWIS.



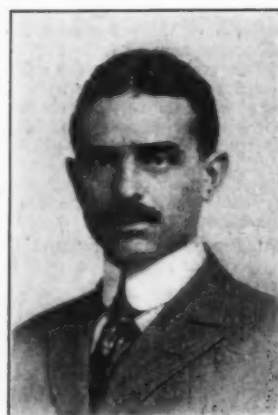
W. O. RUTHERFORD.



P. W. LITCHFIELD.



C. A. DANIEL.

VAN H. CARTMELL,
First Vice-President.HARVEY S. FIRESTONE,
President.H. STUART HOTCHKISS,
Second Vice-President.

W. E. BRUYN.



C. T. WILSON.

Underwood & Underwood, N. Y.
H. S. VORHIS,
Secretary

J. S. LOWMAN.

Underwood & Underwood, N. Y.
W. J. KELLY.

DIRECTORS OF THE RUBBER CLUB OF AMERICA, INC.

provides for a Committee on Arbitration, and specifies its duties as follows:

A Committee on Arbitration to consist of seven members, four of whom shall be manufacturers and three crude rubber importers. The chairman of such committee shall be chosen by the members from their own number for a term of three years, and the term of each of the additional members shall be three years, except that at the time when this committee shall be originally appointed the six members then appointed, other than the chairman, shall decide by lot which of their number shall serve for periods of one, two, and three years respectively, two members of the committee being assigned to each class, and that thereafter two members shall be appointed by the board of directors or by the Executive Committee in each year. If any vacancies should occur in this committee, such vacancies may be filled by the board of directors or by the Executive Committee at any regular or special meeting.

DUTIES. This committee shall have complete supervision in respect to all matters for arbitration referred to The Rubber Club of America, Inc., and shall make rules and regulations for the conduct and disposition of all matters submitted to arbitration subject to the approval of the board of directors or of the Executive Committee. It shall provide a form of agreement not inconsistent with existing provisions of law by which, so far as practicable, the decisions of the arbitrator or arbitrators shall be as effective as judgments of the Supreme Court of the State of New York. It shall compile, and from time to time revise, and keep a list of qualified persons, not less than 25, willing to act as arbitrators under these rules, and who shall be members of The Rubber Club of America, Inc. This list shall be known as "The List of Official Arbitrators of the Rubber Club of America, Inc."

The proposed change in Article III of the Constitution and By-Laws was also adopted to read:

Any person connected with a corporation or firm, and engaged in the rubber industry in the United States of America or the Dominion of Canada, which corporation or firm has been elected a firm member of this association, shall be eligible to membership.

CHANGE OF NAME.

The recommendation of the board of directors that the name of the organization be changed to The Rubber Association of America, as more accurately describing its real character and activities, was then put to a vote and unanimously adopted.

OFFICERS RE-ELECTED.

After the annual meeting the new board of directors went into session and the following officers and Executive Committee of The Rubber Club of America, Inc., were reelected:

OFFICERS.

President, Harvey S. Firestone, Firestone Tire & Rubber Co., Akron, Ohio.

First vice-president, Van H. Cartmell, Kelly-Springfield Tire Co., New York City.

Second vice-president, H. Stuart Hotchkiss, United States Rubber Co. System, New York City.

Secretary and treasurer, Harry S. Vorhis, The Rubber Association of America, New York City.

EXECUTIVE COMMITTEE.

Harvey S. Firestone, Chairman, Firestone Tire & Rubber Co., Akron, Ohio.

George B. Hodgman, Hodgman Rubber Co., Tuckahoe, New York.

William E. Bruyn, L. Littlejohn & Co., New York City.

Van H. Cartmell, Kelly-Springfield Tire Co., New York City.

Paul W. Litchfield, The Goodyear Tire & Rubber Co., Akron, Ohio.

H. Stuart Hotchkiss, The United States Rubber Co. System, New York City.

STANDING COMMITTEES.

The president of the Rubber Club has appointed the following committees:

LEGISLATIVE COMMITTEE.

Frederic C. Hood, chairman, Hood Rubber Co., Watertown, Massachusetts.

H. Stuart Hotchkiss, The United States Rubber Co. System, New York City.

One member yet to be chosen.

ARBITRATION COMMITTEE.

William E. Bruyn, L. Littlejohn & Co., New York City.

Andrew H. Brown, Meyer & Brown, New York City.

W. G. Ryckman, New York City.

William F. Bass, General Rubber Co., New York City.

M. L. Cramer, Michelin Tire Co., Milltown, New Jersey.

Horace De Lisser, Ajax Rubber Co., Inc., New York City.

R. B. Woodbury, Hood Rubber Co., Watertown, Massachusetts, and as alternates:

H. A. Astlett, H. A. Astlett & Co., New York City.

Clement B. McKay, The Fisk Rubber Co., New York City.

NOMINATING COMMITTEE.

Frederick H. Jones, chairman, Tyer Rubber Co., Andover, Massachusetts.

William J. Kelly, Arnold & Zeiss, New York City.

W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio.

Henry C. Pearson, India Rubber Publishing Co., New York City.

Harry G. Fisk, The Fisk Rubber Co., Chicopee Falls, Massachusetts.

AUDITING COMMITTEE.

E. E. Huber, chairman, Eberhard Faber, Brooklyn, N. Y.

William G. Grieb, Ajax Rubber Co., Inc., New York City.

BANQUET COMMITTEE.

William T. Cole, chairman, Fabric Fire Hose Co., New York City.

Francis R. Henderson, Henderson & Korn, New York City.

Tracy S. Lewis, Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut.

OUTING COMMITTEE.

To be selected later by the executive committee.

At a meeting of the executive committee, held January 19, 1917, at the Whitehall Club, 17 Battery Place, New York City, the following firm and associate members were elected:

NEW FIRM MEMBERS.

Rosenwald & Weil, Chicago, Illinois—Representative, H. T. Kessler.

B. S. Ellis, New York City—Representative, B. S. Ellis.

E. S. Kuh & Valk Co., New York City—Representative, Chas. Thorstensen.

Robinson Co., New York City—Representative, Thos. A. Desmond.

T. C. Ashley & Co., Boston, Massachusetts—Representative, Archer S. Pratt.

Somerset Rubber Reclaiming Works, New Brunswick, New Jersey—Representative, A. Marcus.

Chadbourne & Moore, Boston, Massachusetts—Representative, Joseph H. Chadbourne.

Plymouth Rubber Co., Canton, Massachusetts—Representative, Abraham Sydeman (transferred from associate membership).

ASSOCIATE MEMBERS.

Geo. W. Skirm, Trenton, New Jersey, Globe Rubber Tire Manufacturing Co.

E. S. Sloat, Patterson, New York, Mishawaka Woolen Manufacturing Co.

Raymond S. Willis, East Orange, New Jersey, United States Rubber Co.

J. M. S. Carroll, Montreal, Canada, Canadian Consolidated Rubber Co., Limited.

Frank C. Foley, New York City, The Fisk Rubber Co.

Wm. E. Kavenagh, Akron, Ohio, Swinehart Tire & Rubber Co.

Charles W. Barnes, New York City, United States Rubber Co.
Merton A. Turner, South Braintree, Massachusetts, Monatiquot Rubber Works Co.

James H. Stedman, South Braintree, Massachusetts, Monatiquot Rubber Works Co.

DIVISIONS' MEETINGS.

THE following meetings of the divisions of the Rubber Club were held at the Waldorf-Astoria on Monday, January 8:

THE RUBBER & FIBER SOLE MANUFACTURERS' DIVISION was organized, and a Constitution and By-laws adopted. W. H. Yule, The B. F. Goodrich Co., Akron, Ohio, was elected chairman and William M. Gunlock, United States Rubber Co. System, vice-chairman. The following Executive Committee was also elected: W. H. Yule, chairman, The B. F. Goodrich Co.; William Gunlock, United States Rubber Co. System; George E. Hall, Boston Woven Hose & Rubber Co., Cambridge, Massachusetts; C. H. Oakley, Essex Rubber Co., Inc., Trenton, New Jersey; George B. Dryden, Dryden Rubber Co., Chicago, Illinois, and an additional member who will be appointed later.

THE RUBBER SUNDRIES MANUFACTURERS' DIVISION in meeting elected Frederick H. Jones, Tyer Rubber Co., chairman, Andover, Massachusetts; W. O. Rutherford, vice-chairman, The B. F. Goodrich Co., Akron, Ohio, and the following Executive Committee: Frederick H. Jones, chairman, Tyer Rubber Co., Andover, Massachusetts; Russell Parker, Parker, Stearns & Co., Brooklyn, New York; Charles J. Davol, Davol Rubber Co., Providence, Rhode Island; George B. Hodgman, Hodgman Rubber Co., Tuckahoe, New York; E. E. Huber, Eberhard Faber, Brooklyn, New York; Thomas W. Miller, Faultless Rubber Co., Ashland, Ohio.

THE MECHANICAL RUBBER GOODS MANUFACTURERS' Division elected William T. Cole chairman, Fabric Fire Hose Co., New York City; John J. Voorhees, vice-chairman, Voorhees Rubber Manufacturing Co., Jersey City, New Jersey. The Executive Committee consisting of five members will be appointed later.

THE RUBBER RECLAIMERS' CLUB met and voted to organize as a division of the Rubber Club to be known as the Rubber Reclaimers' Division. Captain Francis H. Appleton was elected chairman.

Harry S. Vorhis was elected secretary and treasurer of all the divisions.

AMERICAN COMPETITION IN TIRES RESENTED.

IN a recent Trade Supplement published by the "London Times" a prominent British rubber manufacturer writes as follows:

From the West has come a Colossus which they do fear, and with good cause. It seems a harsh thing to say, but there can be no doubt that the American rubber trade has deliberately set out to capture the business of the British rubber manufacturers whilst the latter are preoccupied and handicapped by war work. Before the war the Americans had secured little or no hold on the British market, and less, to use an Irishism, in the Colonies. Now let the figures speak. In motor tires alone, excluding those fitted to vehicles, the imports into Great Britain have been as follows:

Year 1914	£ 270,550
Year 1915	1,225,422
First half of 1916	1,063,585
The total United States exports of motor tires for the years ended June 30 being:	
1914	\$ 3,505,267
1915	4,963,270
1916	17,936,227

Needless to say the huge increase for 1916 is not a newly-created trade, but the result of a deliberate campaign of flooding our Colonies and other markets with huge quantities of American tires.

The ordinary business man at this stage would naturally ask why the government does not intervene to prevent the import of

unwanted goods and the consequent export of gold to pay for them by a Prohibition of Import Order. But here we enter the realms of high diplomacy. An order was actually made, and withdrawn at the eleventh hour, as it was stated in the House of Commons that an arrangement existed with American manufacturers which precluded the possibility of prohibiting the import of these goods.

It is certain, however, that the first pioneers of British plantation rubber, when they smuggled away the *Hevea* seeds from Brazil, little thought that by giving Britain control of the world's supply of rubber they would be doing at the same time an injury to British rubber manufacturers. Such, however, is in effect what has happened, as the arrangement with American manufacturers was to allow them supplies of British rubber in consideration of their executing all their orders for neutral European countries through Great Britain. If, therefore, there had been no British rubber there would be no American tires now coming into Great Britain.

The planter is inclined to take the view that because he is able to sell his production at a handsome profit all is well with it. He should, however, not wait for the writing on the wall. Some of the world's largest consumers are developing their own estates, mainly to get over this boggy of variability, and the day may come when a rubber will have to stand or fall on its quality and its attainment of a certain standard.

All this points to the necessity of combination between the producing and manufacturing sides of the industry. A joint research commission should therefore be formed composed of the best technical men obtainable on both sides, and a definite program carried out, in the interests of the industry.

It seems a somewhat unfortunate state of affairs that whilst of the expected world's production of crude rubber for 1916 about 75 per cent will be produced within the British Empire, probably not more than about 12 per cent of it will be consumed by British manufacturers. Of the remainder probably 62½ per cent will be used by the United States.

They will probably need for 1916 at least 125,000 tons, which on a rough and ready calculation may be taken to represent the production of goods of a selling value of £125,000,000. Three of the principal concerns will together show a total turnover for the current year of approximately £50,000,000.

As to whether any considerable portion of this huge business could be done on this side under different economic conditions is open to doubt. To commence with it is attributable to a great extent to the universal prosperity and the high wages of the working classes in the States. At the end of this year it is expected that the total number of cars registered in the United States will be 3,250,000, or approximately one to every 32 persons. The consumption of tires in the upkeep of these cars is of course enormous.

The figures for the British rubber trade compared with those for the United States seem small, but none the less it ranks as one of the more important industries of the country, with an output of from twenty to twenty-five millions sterling. At any rate, it is a sufficiently important national asset for the government and nation to see that it is not swallowed up by the American Goliath.

In conclusion, one may be permitted to wonder why, when the nation is being taxed to the uttermost farthing in every direction, neutrals should not be made to bear a slight contribution towards the cost of the war, from which they are profiting so greatly. An export duty on crude rubber sent out of the British Dominions of only 6d. per pound would bring in probably £6,000,000 and would certainly not reduce the exports by one pound. It would, moreover, not make the price prohibitive, as a sixpenny rise in the price of rubber is by no means rare. But perhaps the Rubber Growers' Association would have much to say on such a proposal.

DIRECT SHIPMENT OF RUBBER GOODS TO PORTUGAL.

The following notification has recently been received from the British Consulate General at New York City:

I have to inform you that Portugal may now be regarded as on the same footing as other allied countries in Europe, in connection with the rubber guarantee.

It will, therefore, be in order for manufacturers to ship rubber goods by direct steamer to Portugal in the future.

CORRECTION.

In the notice concerning the resignation of the superintendent of Parker, Stearns & Co. appearing in the January number of THE INDIA RUBBER WORLD, the name should read F. G. Littell, instead of F. G. Hettell.

The New York Automobile Show.

A GAIN previous records have been surpassed at the seventeenth annual National Automobile Show held at the Grand Central Palace, New York City, from January 6 to 13. Attendance and business were the greatest in history and a larger number of cars and chassis—340 in all—was shown by 98 firms. Accessory exhibitors were not as numerous as last season, although occupying 6,000 square feet more space, but their products were no less varied nor interesting, and really sounded the keynote of the show. Of the 230 firms on the official program many were manufacturers of goods containing rubber. As in the past, several large tire concerns did not exhibit but the many cars shown displayed most of the leading tires and treads, while the Firestone, Goodrich, Ajax and Century firms were represented by advertisements in the program. Among the exhibits of interest to readers of THE INDIA RUBBER WORLD may be mentioned the following:

TIRES AND TUBES.

The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio, showed its "Angle" and "Runner" tread tires, built up in the center where the most wear comes; also its extra heavy red tubes and regular gray tubes.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, displayed the Dayton pneumatic tire with its heavy central rib and open-weave breaker strip forming a reinforcement around the rubber and riveting it thoroughly to the carcass.

Century, hand-made, oversize tires and Century red inner tubes were the products of the Rubber Insulated Metals Corporation, Plainfield, New Jersey. A convenient type of rubber-handled, insulated pliers for safety in repairing the electrical equipment of motor cars was also offered.

General tires were shown by the General Tire Co., Akron, Ohio.

The Woodworth Manufacturing Corporation, successor to the Leather Tire Goods Co., Niagara Falls, New York, demonstrated the construction of the Woodworth Trouble-Proof tire with its strip of chrome leather inside the shoe where it is not subjected to the action of moisture and dirt; also an inner tube with the grain of the several plies running in different directions to reduce tearing to a minimum. The Woodworth Tread and Woodworth Overshoe, both of studded leather, were shown together with a line of tire accessories including tire boots, inner sleeves, inside patches, fan belts and Easyon tire chains.

The air-retaining qualities of Bonner tubes, which are claimed to be self-closing when punctured, was demonstrated by the Brunswick-Balke-Collender Co., Chicago and New York. The tread, into which is vulcanized a strip of non-stretchable fabric, is built to extra thickness by the laminated process and turned inside out before joining the ends. The larger circumference thus becomes the inner circumference and when the tube is inflated the thickened rubber tread is automatically compressed to a point where it will close all ordinary punctures instantly and without loss of air pressure.

TIRE REPAIR DEVICES.

The Adamson Manufacturing Co., East Palestine, Ohio, featured four vulcanizers and Adamson repair gum requiring no cement. Of the vulcanizers Model "U" is for tubes and casings; Model "T" for inner tubes only; Model "S" for private garages and repair shops, and Model "M" for cycle tubes.

The C. A. Shaler Co., Waupun, Wisconsin, had a complete exhibit of similar vulcanizers, small portable and garage installations, with heat from gasoline, alcohol, electricity and steam.

The exhibit of Stevens & Co., New York City, consisted of the Sampson repair kit for inner tube work, including the Sampson Featheredge Puncture plug, an ingenious quick-repair device

composed of two rubber disks with perforated metal centers and a screw wire to draw the disks together. The hole is punched round to prevent tearing, spread with special pliers, the plug inserted and screwed up tight. Upon breaking off the wire below the surface of the plug and inflating the tire, the plug conforms to the inside of the casing as flat as a patch, and no wear, chafing or cutting is said to be possible.

The Eastern Rubber Co., Philadelphia, Pennsylvania, demonstrated Magic Rubber Mend, an inexpensive preparation for repairing quickly without vulcanization all articles of soft rubber, including punctured tubes. The result is said to be permanent and unaffected by heat, cold, moisture or dry air.

TIRE TOOLS AND ACCESSORIES.

The space occupied by the Stewart-Warner Speedometer Corporation, Chicago, Illinois, was devoted to an attractive presentation of several well-known and popular devices, including the Stewart engine-driven pump.

The Kellogg Manufacturing Company, Rochester, New York, had on view a motor-driven pump either air or water cooled.

The Crane tire pump was featured in the exhibit of the Bay State Pump Co., Boston, Massachusetts.

Air compressors were shown by the Auto Compressor Co., Wilmington, Ohio, and a two-stage type with models for all requirements was offered by the United States Air Compressor Co., Cleveland, Ohio.

Jacks and other specialties were offered by Lane Bros. Co., Poughkeepsie, New York; F. W. Mann Co., Milford, Connecticut; Moreau & Pratt, Inc., New York City; Weaver Manufacturing Co., Springfield, Illinois.

Standweld rims, seamless steel and brass tubing comprised the display of the Standard Welding Co., Cleveland, Ohio.

The simple and effective device of the Eureka Rim Compressor, Inc., Addison, New York, for the quick removal of tires from transversely split rims attracted favorable attention.

TOPS AND TOP MATERIALS.

L. J. Muttly Co., Boston, Massachusetts, showed its well-known Bull Dog rubberized mohair and cotton cloths for automobile tops and slip covers; also Numotor fabrics for top and seat cover purposes.

Neverleek for the same purposes was displayed by F. S. Carr Co., Boston, Massachusetts. Three surfaces in imitation of grain leather were offered; one dull and two semi-bright.

The Pantasote Co., New York City, demonstrated the sterling qualities of Pantasote for motor-car tops. This waterproof material is not merely a rubberized cloth, but consists of four layers, the surface coating with grain finish, fine cotton fabric, cementing gum, and a lining fabric of coarse weave.

The Detroit Weatherproof Body Co., Detroit, Michigan, had on view its all-weather, detachable top of high-grade waterproof material which converts the ordinary car into a limousine and is ideal for changeable weather. Patented Flexible sliding doors upon opening disappear instantly into the permanent roof, and the entire side sections may be quickly removed when so desired. This top weighs only about 50 pounds more than the ordinary type, including an electric dome lamp ready for connection at the dash.

The Laidlaw Co., Inc., New York City, showed Mortex for tops and cover purposes.

RUBBER ACCESSORIES.

Essex inner tubes—Royal Blue, Master Red and Champion Gray—were the principal exhibit of the Essex Rubber Co., Trenton, New Jersey. The company also manufactures a line of miscellaneous rubber accessories, including blow-out patches, tire

plasters, outer boots, reliners, pump, generator and lamp tubing, brake band lining, radiator hose, spring bumpers, gas engine packing, fan belts, rubber matting, hard rubber radiator caps and steering wheels, bicycle grips and goggles, many of which were shown.

An exceptionally complete line of rubber accessories was shown by the Voorhees Rubber Manufacturing Co., Jersey City, New Jersey. Of principal interest were the "Ideal" (red) and "Model" (gray) laminated tubes for automobiles and motorcycles. In addition to reliners, inner sleeves, boots, patches and all the customary materials for roadside repair, the firm deals in vulcanizing gums of all sorts, rebuilding fabrics and cements for the professional tire repairman, and also manufactures hose and tubing, fan belts, windshield packing, matting, sheet packing, bumpers, round springs, washers and rubber mallets.

Charles O. Tingley & Co., Rahway, New Jersey, offered a comprehensive line of sundries for automobile and cycle tire repair, featuring the C. O. T. Cement Cure Patches, Cure Tight Gum for tube blowouts, and String Repair Kit Plugs.

ELECTRICAL DEVICES.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, manufacturers of motors for all purposes, presented automobile motor-generator sets for charging, lighting, starting and ignition.

The General Electric Co., Schenectady, New York, also offered generator lighting and starting systems, electric lamps, bulbs, rectifiers and other specialties.

Other exhibitors of lighting and starting systems included the A. B. C. Starter Co., Detroit, Michigan; Bosch Magneto Co., New York City; Disco Electric Starter Corporation, Detroit, Michigan; Gray & Davis, Inc., Boston, Massachusetts; the John Heinze Co., Springfield, Ohio; Kemco Electric Manufacturing Co., Cleveland, Ohio; Leece-Neville Co., Cleveland, Ohio; North East Electric Co., Rochester, New York; A. J. Picard & Co., New York City; United States Light & Heat Corporation, Niagara Falls, New York; Wagner Hoyt Electric Co., New York City; Ward-Leonard Electric Co., Mount Vernon, New York.

The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin, well known for its electrical control devices used extensively in rubber factories, attracted favorable notice with the compact, efficient C-H Magnetic Gear Shift and small, rugged automobile lighting switches for dash and steering post.

The General Bakelite Co. of New York City made an interesting display of molded electrical insulation.

Storage batteries were displayed by the Detroit Battery Co., Detroit, Michigan; Dyneto Electric Co., Syracuse, New York; Electric Storage Battery Co., Philadelphia, Pennsylvania; Gould Storage Battery Co., New York City; Paul N. Marko, Brooklyn, New York; Philadelphia Storage Battery Co., Philadelphia, Pennsylvania; Prest-O-Lite Co., Indianapolis, Indiana; United States Light & Heat Corporation, Niagara Falls, New York; Wagner-Hoyt Electric Co., New York City; Willard Storage Battery Co., Cleveland, Ohio.

Ignition devices for gasoline engines of every sort are manufactured by the following firms which were numbered among the exhibitors: Bosch Magneto Co., New York City; Ericsson Manufacturing Co., Buffalo, New York; Emil Grossman Manufacturing Co., Brooklyn, New York; The John O. Heinze Co., Springfield, Ohio; Heinze Electric Co., Lowell, Massachusetts; Herz & Co., New York City; Kent Manufacturing Works, Atwater, Philadelphia, Pennsylvania; K. W. Ignition Co., Cleveland, Ohio; Mosier & Co., Mount Vernon, New York; New York Coil Co., New York City; Splittorf Electrical Co., Newark, New Jersey.

MISCELLANEOUS ACCESSORIES.

Charles E. Miller, New York City, with 15 stores in nine states, offered its complete line of sundries for motor-cars, motor-boats, motorcycles and motor-planes, among which were pneumatic tires and tubes of leading makes, repair materials and devices, together

with many varied tire and other rubber accessories, including the Twombly foot pump, which indeed "makes hard work a pleasure." The Vul-car, said to be the only alcohol-burning, portable vulcanizer for roadside repairs that protects the rubber with moisture so it cannot burn, was also of interest.

The silent chain employed in connection with the electrical equipment of rubber factories also supplies the "front end drive" of many automobiles, as exhibited in its latest improved form by the Morse Chain Co., Ithaca, New York.

A. Schrader's Son, Inc., Brooklyn, New York, offered the well-known "Universal" line of tire valves and accessories, in connection with which a unique circular was distributed. It had the appearance of an inter-line coupon railway ticket, as long as a man's arm, divided into eight detachable portions, one bearing the legend, "A Joy Ride to Contentment via A. Schrader's Son, Inc., Air Line," and each of the others bearing a cut and description of one of the "Universal" devices together with bright headlines in railway parlance.

The Raybestos Co., Bridgeport, Connecticut, showed its well-known brake linings and also demonstrated Royal brakes.

The Invincible Tire Tester, manufactured by the United States Gauge Co., New York City, in the shape of a watch, not only records the actual air pressure, but shows the proper pressure to be maintained in tires of various sizes.

Adams & Findley, New York City, offered the Rives Adjustable Neverslip Pedal Pads for greater safety in driving.

The Mattson Rubber Co., Lodi, New Jersey, showed the Mattson Slip-On Pedal Pads, readily adjustable in a few minutes and no metals to attach.

In connection with the Hoskyns Universal All-Weather Top for Ford Cars, displayed by the Universal Motor Products Co., Indianapolis, Indiana, rubber weather strips are ingeniously used to keep out drafts and eliminate noise.

The Metal Specialties Co., Chicago, Illinois, had a varied line of accessories and parts, including a few rubber goods.

THE BILTMORE SHOW.

The Miller Rubber Co., Akron, Ohio, displayed its large and varied line of rubber goods, featuring the new Miller "geared to the road" black-tread tire, red and gray tubes, and miscellaneous



MILLER DEMOUNTABLE CUSHION PAD
FOR TRUCK TIRES.

and repair materials, including retread bands, vulcanizing cement, Pluggum and the Shurtite tube repair kit, self-vulcanizing. An air bag for vulcanizing casings was shown and considerable interest was manifested in the Miller Demountable Cushion Pad, a shock-absorbing device for truck tires. It comprises a flat ring to be placed between the wooden felly of the wheel and the steel base of the solid rubber tire, consisting of a single strip of soft but tough resilient rubber $\frac{3}{4}$ inch thick with steel flanges on each side held in place by bolts let through the rubber from side to side at regular intervals. Many attractive circulars in English and Spanish were distributed, including a few devoted to balloons and toy novelties and druggists' sundries, also a convenient vest-pocket tire mileage record.

and repair materials, including retread bands, vulcanizing cement, Pluggum and the Shurtite tube repair kit, self-vulcanizing. An air bag for vulcanizing casings was shown and considerable interest was manifested in the Miller Demountable Cushion Pad, a shock-absorbing device for truck tires. It comprises a flat ring to be placed between the wooden felly of the wheel and the steel base of the solid rubber tire, consisting of a single strip of soft but tough resilient rubber $\frac{3}{4}$ inch thick with steel flanges on each side held in place by bolts let through

Tires and inner tubes were shown by the Norwalk Tire & Rubber Co., Norwalk, Connecticut.

In the space occupied by the H. W. Johns-Manville Co., New York City, were seen the well-known J-M Non-Burn Asbestos brake lining, fire extinguisher, Soot-Proof spark plug and speedometers.

S. A. E. ANNUAL MEETING.

THE attendance at the annual meeting of the Society of Automobile Engineers, held January 11, during Automobile Show Week in the Engineering Societies Building, New York City, exceeded all previous years, partly because of the interesting papers announced, but chiefly because of the broader present scope of the society, which now includes the designers of all forms of self-propelled vehicles and boats, including the airplane and tractor. The new members for 1916 number 338, bringing the total membership up to 2,121.

Perhaps the most important action at the meeting was the acceptance of the proposal to change the name to "The Society of Automotive Engineers," which will now be put to a vote by mail.

The following officers were elected for the ensuing year: George W. Dunham, president; Jesse G. Vincent, first vice-president; Charles M. Manly, second vice-president; Herbert Chase, treasurer; Benjamin B. Bachman, Harry L. Horning and Charles W. McKinley, members of the council for two years; Frederick E. Moskovics, member for one year.

All the Standards Committee reports were approved with little or no opposition except that of the Committee on Tires and Rims relative to truck tires, including the following proposed standard table for the carrying capacities of solid rubber tires:

Nominal width of tires	Gross load per wheel in pounds.	
	Tire diameter 36 inches and under	Tire diameter 40 inches and over
3 inches	1,000	.....
3½ inches	1,300	.....
4 inches	1,700	.....
5 inches	2,500	2,600
6 inches	3,300	3,500
7 inches	4,200	4,500

The tolerance allowed was considered too generous by several members and this section was therefore referred to the Truck Standards Division for further study.

THE S. A. E. BANQUET.

Over 800 members gathered at the Hotel Biltmore on the evening of January 11 for the annual banquet which was the greatest similar event in its history. Judge Charles F. Moore was toastmaster and the speakers included Russell Huff, past president of the society, who reviewed S. A. E. accomplishments of the past year, and Howard E. Coffin, chairman of the Industrial Preparedness Committee of the Naval Consulting Board, whose subject was preparedness as affecting automobile manufacturers.

The principal speaker of the evening, however, was Hon. John Barrett, director-general of the Pan-American Union, who discussed "Pan-Americanism" and what it means to manufacturers of automobiles and their accessories. After sketching briefly the facilities afforded by the Pan-American Union to those wishing to enter the South American market—the only one now freely open to American manufacturers—he presented several significant facts no less important to manufacturers of tires than of automobiles. Said he:

South America's economic evolution will be accomplished in direct proportion to its use of automobiles. Except for Argentine, the growth of population in South American countries and the operation of their industries depend on good roads and automobiles. If 100,000 miles of good roads could be built in South America an unbelievably large market for American cars would be created.

Mr. Barrett then explained that in South America it is cheaper to build a highway that will stand automobile traffic than to build railroads that would furnish even a part of the service that the motor highway would afford. But development in South America is dependent almost entirely upon the facilities for securing loans to finance improvements, and he made a plea for automobile manufacturers to impress upon their bankers that the sale of automobiles and accessories below the equator can best be promoted by providing American dollars or equivalent credit. Fifty million dollars of surplus profits loaned to South America, he said, would return 50 per cent profit and aid the automobile industry to a degree that could not be estimated in figures.

THE MOTOR AND ACCESSORY MANUFACTURERS.

At the recent annual meeting of the board of directors of the Motor and Accessory Manufacturers the following officers were elected for the ensuing year: C. W. Stiger, president; Charles E. Thompson, first vice-president; E. H. Broadwell (vice-president of The Fisk Rubber Co., Chicopee Falls, Massachusetts), second vice-president; T. J. Wenzel, third vice-president; L. M. Wainwright, treasurer; Alfred P. Sloan, secretary and assistant treasurer.

The present board of directors consists of: C. W. Stiger, C. E. Thompson, T. J. Wenzel, E. H. Broadwell, L. M. Wainwright, Alfred P. Sloan, Jr., James H. Foster, E. W. Beach, Christian Girl, W. O. Rutherford, William C. Rands, William M. Sweet and L. M. Bradley.

The board of directors has agreed to sanction the exhibit in a body of a goodly number of members at the first Pan-American Aeronautic Exposition, to be held in the Grand Central Palace, New York City, February 8 to 15.

The annual banquet, accompanied by music and vaudeville, was held the evening of January 10 at the Waldorf-Astoria and pronounced an unqualified success, about 600 being in attendance. As usual, there was no speechmaking.

FIRST PAN-AMERICAN AERONAUTIC EXPOSITION.

The manufacture of aeroplanes has ceased to be a mere "game." It is now counted as one of our great American industries, and the importance and significance of the first Pan-American Aeronautical Exposition, to be held in the Grand Central Palace, February 8 to 15, can hardly be overestimated. Manufacturers of rubberized fabrics and miscellaneous accessories containing rubber will be numbered among the exhibitors, many of them members of The Motor and Accessory Manufacturers, whose cooperation and standardized products promise to make bulk production a feature as vital to the continued growth of this industry as it has been to the building of automobiles. The United States Government will also have an elaborate exhibit.

A few salient facts describe the meteoric growth of this new industry. Two aeroplane companies in America are now capitalized at over \$10,000,000, and 14 factories in this country employ over 10,000 men. Aeroplanes to the value of \$30,000,000 were built in the United States last year, and this year's business is estimated at \$50,000,000. The United States Government alone has appropriated \$35,000,000 for the purchase of aeroplanes for the Army, Navy and Post Office Departments.

The war has demonstrated the value of the aeroplane as an instrument of defense and developed its highly specialized construction for scout work, battle and transportation. In the latter field machines capable of lifting 15 tons and flying at a speed of 125 miles an hour have become a practical accomplishment. As a result of the war large numbers of men have trained for flying. There are about 1,000 aviators in America; France has over 5,000 and England over 40,000, while the total Royal Flying Corps of England is said to number over 40,000.

What the Rubber Chemists Are Doing.

VULCANIZATION TESTS.

EATON and Grantham's recent paper on "Variability of Plantation Rubber in Technical Mixings," abstracted in THE INDIA RUBBER WORLD last month, is discussed by Doctor H. P. Stevens in the "Journal of the Society of Chemical Industry" (November 30, 1916).

Doctor Stevens states that he is in general agreement with Eaton and Grantham as to the effect of introducing mineral matter or reducing the proportion of sulphur. The result is that the introduction of a few per cent of litharge almost obliterates the difference in the rate of cure between the fast and slow curing rubbers. The importance of litharge as an ingredient of technical mixings cannot be over-rated; possibly more than half the rubber goods manufactured contain litharge, and that is why some manufacturers use a mixing containing litharge for testing purposes.

Eaton and Grantham attribute the effect of litharge entirely to its action as an accelerator, but if this explanation were sufficient, magnesia should produce a similar effect. A better explanation is found in Doctor Stevens' research on the function of litharge in vulcanization [Journal of the Society of Chemical Industry, May 31, 1915, and THE INDIA RUBBER WORLD, August 1, 1915]. The conclusions there reached were: (a) That the addition of litharge in moderate quantities increases the coefficient of vulcanization; (b) that the maximum coefficient of vulcanization is obtained where there is just sufficient sulphur to cure the rubber fully and to convert all the litharge to lead sulphide and sulphate; (c) that increasing proportions of litharge cause a progressive reduction in the coefficient of vulcanization, a larger percentage of lead sulphide and sulphate being formed; (d) that the percentage of free sulphur drops suddenly at the point where the rubber is fully cured; (e) that even with large proportions of litharge a little free sulphur always remains.

If a simple relationship between the "optimum" cure and the correct cure be required merely as a working hypothesis, Doctor Stevens suggests that a geometrical relationship be adopted and to calculate the correct cure of the second sample by multiplying by the correct cure of the first and dividing by the "optimum" cure of the first.

IMPERIAL INSTITUTE VULCANIZATION TESTS.

Further investigations have been made at the Imperial Institute, London, on samples prepared in Ceylon by L. E. Campbell to determine the influence of various factors on the vulcanizing and mechanical properties of rubber. The subject is treated in full in the Department of Agriculture Bulletin, Ceylon, No. 24.

The following summary of these investigations is from "The India Rubber Journal" (December 2, 1916) and deals with the following:

(1) The effect of the form of the rubber, sheet, crêpe and block; (2) the effect of drying in air at ordinary temperature, in hot air and in a vacuum drier; (3) the effect of over-working the freshly coagulated rubber. Incidentally, comparison of rubber coagulated with acetic and hydrofluoric acid showed the former usually had the shorter time of vulcanization.

SUMMARY OF RESULTS.

The results recorded in this summary confirm those previously obtained in showing that plantation Para rubber is quite satisfactory in mechanical properties, the average tensile strength being fully equal to that of specimens of the best hard Para and the average elongation at the breaking point, only very slightly lower.

The chief variation is in the time required for correct vulcanization. There is no doubt from the results now available that

the conversion of the freshly coagulated rubber into crêpe lengthens the time of vulcanization, as compared with that of the corresponding sheet. In eleven comparative sets of specimens dealt with in this summary, the thin crêpe rubber had a distinctly longer time of vulcanization than the sheet, the figures ranging from 105 to 130 minutes for the crêpe and from 60 to 75 minutes for the sheet. It is noteworthy, too, that this lengthening of the time of vulcanization is brought about by passing the rubber through the rollers only five or seven times, and that additional treatment in the machine, up to 70 times through the rollers, has little further effect on the time of vulcanization. Thus the times of vulcanization of crêpe rubber passed through the rollers 7, 35, and 70 times were 113, 115 and 130 minutes, and the times for rubber treated 5, 25 and 50 times were 105, 115 and 115 minutes, respectively. The time for the control sheet was 75 minutes in each case.

Although the conversion of freshly coagulated rubber into crêpe has this marked effect on the time of vulcanization, the tensile strength is again shown to be but little affected, the difference in the breaking load of the sheet and crêpe being small. In the specimens previously dealt with the advantage in average tensile strength was invariably in favor of the sheet, but the crêpe may have the higher value, as is the case in four of the six sets of specimens.

The "over-working" of the freshly coagulated rubber in the washing machine had little effect on the tensile strength, or on the time of vulcanization. Rubber passed through the rollers 50 or 70 times differed only slightly in either of these respects from rubber treated five or seven times. The common opinion that the mechanical properties may be easily impaired by "over-working," does not receive support from the results of these experiments.

The conversion of thin crêpe into thick crêpe, by rolling several pieces together, did not produce any difference in the time of vulcanization, and the differences in tensile strength were not very marked or constant. The block rubber, made by compressing thin crêpe, had the same time of vulcanization as the latter, but in five out of six sets of specimens its tensile strength was a little lower.

The different methods of drying employed: (1) Air drying at the ordinary temperature; (2) drying in hot air; and (3) in vacuo, had very little effect on the time of vulcanization or tensile strength of the rubber.

RELATIONSHIP OF MECHANICAL TO CHEMICAL PROPERTIES.

Doctor D. Spence in "The India Rubber Journal" writes as follows on the relationship of mechanical to chemical properties of vulcanized rubber:

From experiments made there is no question that the combined sulphur at "optimum" cure in the case of *Hevea* plantation rubber is a remarkably constant quantity, equal on the average to approximately 2.8-3 per cent. Where more than this amount of combined sulphur has been found, either the method of vulcanization is at fault or the means of determining the "optimum" cure are inaccurate. In this connection it is necessary to point out that in the case of very soft, low-grade rubbers it is difficult to judge of the "optimum" cure, and there is always the tendency to increase the cure to beyond the "optimum" point in the hope of thereby improving the physical or tensile properties of the product. In the case of any good grade of *Hevea* plantation rubber there is no such difficulty, however, and where more than 2.8-3 per cent of combined sulphur is reported in this case, either the sample is over-cured, or what amounts to the same thing, vulcanization has not been properly carried out. With proper methods of vulcanization, and with the requisite experience in the judging of the proper cure, the combined sulphur at "op-

timum" cure should never greatly exceed the figures we have given. It should be pointed out, however, that if the time of cure required to produce the "optimum" result is extended, the chances are an increase in the amount of the combined sulphur at the "optimum" point over the figures we have given will be found; depolymerization, requiring an increase in cure to bring the rubber up to apparent physical "optimum" leads to an increase in the combined sulphur considerably over the amount which we have given. The rubber in this case is nevertheless over-cured, and where the vulcanization of the rubber is carried out scientifically, in a minimum of time, and with the least possible injury to the molecule, the combined sulphur at "optimum" cure will never be found to exceed 3 per cent.

Whether these figures obtain for rubbers of different botanical origin or not we have not sufficient analytical evidence at present to say. The constancy of this result is deduced from experiments made on *Hevea Brasiliensis* rubber only. The relation between the rubber and combined sulphur at correct cure is so constant that it is regarded as representing a more or less definite compound of rubber and sulphur to which a formula may be assigned on the assumption that partial valencies of the rubber aggregate have not all the same affinity for sulphur.

It may be of interest to record the fact that we have observed that the point at which the physical properties of pure balata on vulcanization suddenly change to more nearly resemble those of rubber, corresponds very closely with a combined sulphur content of 3 per cent. If pure balata is mixed with a little sulphur and a suitable catalyst, which is essential to its proper vulcanization, it will be found that when about 3 per cent of sulphur has combined with the balata, the physical properties of the vulcanized balata change from those of a hard inelastic product, more like hard rubber, to a pliant, semi-elastic product, more nearly resembling soft vulcanized india rubber. This phenomenon is exceedingly remarkable and interesting, as the transition point in the physical characteristics of balata on vulcanization occurs at about the same degree of chemical vulcanization as corresponds to the "optimum" cure of vulcanized india rubber. This has given rise to a number of experiments by us, with a view to converting balata into rubber and vice versa, some of which have led to exceedingly interesting results.

METHODS OF ANALYSIS.

EXAMINATION OF VULCANIZED RUBBER GOODS.

THE following methods are standard for the examination of vulcanized rubber goods as specified by the Board of Estimate and Apportionment of New York City.

The methods for free sulphur, mineral fillers, vulcanized rubber gum by weight, and vulcanized rubber gum by volume, have already been given in this department (August 1, 1915), and are here omitted.

PREPARATION OF SOFT RUBBER FOR ANALYSIS.

A sample of not less than 25 grains is made by taking pieces from various parts of the original sample. The backing of fire hose is buffed off before grinding; in all other hose separate samples of tube and cover are made without removing the backing or the friction compound. Other rubber goods containing frictioned fabric and rubber layers are ground up without removal of the adhering friction.

The sample is cut into small pieces and run through the grinder, taking for analysis only such material as will pass a 20-mesh sieve. The grinder should not become appreciably warm during the grinding. If the material gums together and cannot be sieved, it is simply passed twice through the grinder and all the material taken for the final sample. Crude rubber is cut with scissors.

A strong magnet is passed through the sample to remove any metal from the grinder and the thoroughly mixed sample is put

in tightly-stoppered bottles and kept not exposed to sunlight or heat.

Hard rubber is prepared for analysis by rasping.

ACETONE EXTRACTION.

Place a two-gram sample, which has been ground not more than 24 hours before, in an acetone-extracted paper thimble, and insert in a glass syphon cup under a condenser. Dry and weigh a clean 8 by 1¼-inch test tube, weighing between 20 and 40 grams, by means of a wire loop; pour in 50 cc. acetone, connect the apparatus, and extract continuously for 8 hours in such manner that the drops of condensed solvent will fall directly on the ground rubber; that the syphon cups will fill in 2½ to 3½ minutes; that the discharge of the syphon cup will not appreciably interrupt the boiling; that the condensed solvent will filter rapidly through the paper thimble, and that no fine particles of rubber or fillers will be carried over. If the solution in the cup is colored after eight hours' extraction, the extraction is continued for four hours the next day. Evaporate the acetone from the tube in a slanting position over live steam, wipe off the outside with a clean linen cloth, and dry to constant weight in a water oven at 95 to 100 degrees C., or until the weight increases, cooling in a desiccator. Calculate and record as "total acetone extract."

ORGANIC ACETONE EXTRACT.

When waxy hydrocarbons are not to be determined, subtract the percentage of free sulphur from the percentage of total acetone extract above, and record the difference as "organic acetone extract."

TOTAL SULPHUR.

A half-gram sample with six grams of potassium carbonate and four grams of sodium peroxide are mixed by rotating in a crucible; cover, heat at a low temperature over an asbestos shield to avoid sulphur fumes, until the mixture fuses, then bring to quiet fusion for 15 to 20 minutes. Avoid rapid heating and explosions. Rotate the melt while solidifying. When cool, put crucible and cover into a casserole containing 200 cc. of water, add five to ten cc. of bromine, and boil until the melt is dissolved. Allow to settle, decant, filter and wash through a thick filter with hot water. Acidify the filtrate with hydrochloric acid, using Congo red paper, make up the volume to 400 cc., and precipitate, boiling with 10 cc. of a 10 per cent solution of barium chloride, keeping the beaker covered with a watch glass. Allow the precipitate to stand over night, filter on an asbestos mat in a Gooch crucible, wash with hot water, ignite, and weigh, cooling in a desiccator. Calculate to sulphur (factor 0.1372) and record as "total sulphur."

OILY FOREIGN MATTER.

Where the presence of tar, pitch or asphalt is not indicated, spread out the rubber residue from the acetone extraction and dry in the water bath at 95 to 100 degrees C. until the odor of acetone is no longer apparent. Transfer to a 100 cc. pressure flask fitted with washers previously extracted with alcoholic potash. Add 50 cc. of alcoholic potash, stopper and heat in an air oven kept between 105 and 110 degrees C., for four hours. Cool the flask, filter and wash the residue with hot absolute alcohol until the washings are no longer colored. Make the filtrate strongly acid with concentrated hydrochloric acid to precipitate potassium chloride, allow to settle, filter and wash with hot chloroform into a small casserole. Place the casserole on the steam bath and evaporate until the odor of hydrochloric acid just disappears. Take up the residue with chloroform, filter and wash with hot chloroform into a weighed beaker, evaporate the chloroform on the steam bath and dry the residue in the water oven at 95 to 100 degrees C., in 15-minute periods, until the weight is constant, or increases, cooling in a desiccator. If the residue is not oily to the touch no report shall be made. If the residue is oily to the touch, subtract 2 per cent of the weight of vulcanized rubber gum, as determined below, from the cal-

culated amount found, and record the balance as "oily foreign matter."

TARRY FOREIGN MATTER.

If the compound is light in color, tar, pitch and asphalt shall be considered absent. If the compound is dark or black in color the residue after the acetone extract determination above, without removing the acetone, and before the alcoholic potash is made, is extracted with chloroform for four hours in the same manner and by the same procedure as for the acetone extraction. If the extract is very dark in color, or the residue is tarry, from its calculated amount shall be subtracted 3 per cent of the weight of vulcanized rubber gum, as determined below, and the balance recorded as "tarry foreign matter."

PRECAUTIONS.

When the chloroform extraction is made the day after the acetone extraction, the rubber residue shall be covered with acetone over night. When the alcoholic potash extraction is made the day after either the acetone extraction or the chloroform extraction, the dried rubber residue shall be covered with the alcoholic potash over night.

CARBONACEOUS FOREIGN MATTER.

Heat about one gram sample with 30 cc. of concentrated nitric acid and 15 cc. water. A black insoluble residue indicates the presence of carbon, as lampblack, graphite, etc. Examine the ground rubber under the microscope and observe the residue of fillers in the mineral fillers determination. If fibers or carbon are seen, except as a trace, proceed as follows:

The crucible containing the fillers is washed with hot dilute hydrochloric acid and hot water to decompose carbonates and sulphides, dried to constant weight at 105 to 110 degrees C., desiccating until cool. The crucible is then ignited to constant weight and the loss calculated and recorded as "carbonaceous foreign matter," and shall be subtracted from the percentage of "mineral fillers" recorded above.

SPECIFIC GRAVITY.

Make the determination on a strip or strips not less than five grams weight. Weigh to one milligram in air, then thoroughly wet with water, pressing and squeezing, with the fingers under water, to remove bubbles or films of air. Weigh to one milligram in water at 20 degrees C. (taken as 1.00), calculate to 0.001 and record as "specific gravity."

RATIOS.

Free sulphur and organic acetone extract are separately calculated and recorded as percentages by weight of vulcanized rubber gum present.

CHEMICAL PATENTS

THE UNITED STATES.

PHENOLIC CONDENSATION PRODUCT. A coating* composition containing a phenolic condensation product and a cellulose ester, in conjunction with tetrachlorethane. [Whitney B. Jones, Perth Amboy, New Jersey, assignor to General Bakelite Co., New York City. United States patent No. 1,209,165.]

DENTAL RUBBER COMPOSITION. Dental plates made of finely ground vulcanized rubber compounded with raw rubber. The object is to neutralize the expansion of the one by the other during vulcanization. [S. G. Supplee and C. J. R. Engstrom. United States patent No. 1,204,609.]

THE UNITED KINGDOM.

VULCANIZATION AGENT. Nitrosophenols or their homologues, such as nitrosocresols or nitrosoxylenols, are used for facilitating the vulcanization of natural or artificial caoutchouc or caoutchouc-like substances. In an example, ten parts of sulphur and one part of nitrosophenol are used for vulcanizing 100 parts of rubber at a temperature of 135-145 degrees C. [S. J. Peachey,

Priestnall Road, Heaton Mersey, England. British patent No. 101,819.]

CEMENTING EBONITE. Parts of ebonite articles are cemented together by means of a solution of celluloid in amylacetate or other solvent. [C. A. Vandervell, Warple Way, Acton Vale, Middlesex, England. British patent No. 12,075 (1915).]

FIBROUS SHEET. Sheet material from fibers arranged substantially parallel is impregnated by a binding material; impregnation done in a vacuum. Multiple-ply stock, with cross layers of fibers, may be made from such material; and in that state is applicable to the manufacture of tires, hose, matting, belting, covers, heels and soles. [Rubber Regenerating Co., New York City. British patent No. 101,318.]

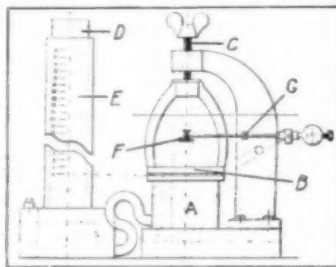
SWITZERLAND.

ELASTIC PRODUCT. A composition of gas tar, rubber, ordinary cement and mineral filling. The gas tar minus some of its oil is mixed with rubber dissolved in a solvent composed of benzene and carbon disulphide. This mass is liquified by heat, and cement and mineral filling added. The resulting mass is mixed and molded hot. [C. A. C. de Caudemberg. Swiss patent No. 73260, (Sept. 16, 1916).]

LABORATORY APPARATUS.

INSTRUMENT FOR MEASURING WATERPROOFING EFFECT ON FABRICS.

AN instrument recently invented for measuring the impermeability of waterproofing on cloth has been described in the "Journal of the Society of Dyers and Colorists." The method



of measurement is based on the determination of the number of hammer strokes upon the cloth before the water percolates through, the cloth being pressed upwards by a column of water. The instrument consists of a copper cylindrical box A on the top of which is fixed by a ring,

B, tightened with a screw C, the cloth to be tested. The pressure of water against the cloth is regulated by the movement of the wooden cylinder D in the glass reservoir E, on which the height of the water is marked in centimeters.

When the water is five centimeters high the hammer F is dropped. The hammer has a weight of three grams, which may be increased by a movable weight G. After the first stroke the water is raised one centimeter, and after every subsequent stroke it is raised again. The number of strokes required before the water appears on the surface of the cloth shows the degree of impermeability.

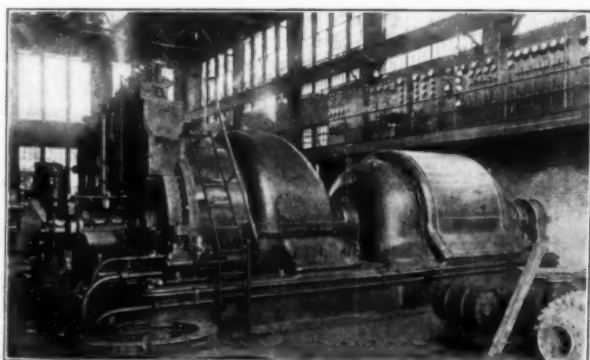
SULPHURIC ACID IN 1916.

Market conditions throughout the country are reported to have been on the whole better than in 1915, despite the somewhat higher value of the product. Reclaimers of rubber will be interested to know that according to reliable estimates by the United States Geological Survey the output of acids of strengths of 60 and 66 degrees amounted to nearly 950,000 tons, or practically the same as in 1915. The total estimated production of sulphuric acid, however, of strengths of 50, 60 and 66 degrees was 4,475,000 tons as expressed in terms of 50-degree acid, representing an increase of 600,000 tons or more than 15 per cent. The most notable feature in the sulphuric acid industry was the enormous increase in the production of acids of strengths greater than 66 degrees. The estimate shows a production of over a million tons as against less than 200,000 tons in 1915.

New Machines and Appliances.

A RUBBER MILL STEAM TURBINE.

THE reciprocating steam engine as a factor in the production of power for industrial purposes is now generally conceded to be almost negligible. True, there is occasionally found in modern plants that well-known type of reciprocating engine, the Corliss, which has dominated the field for many years.

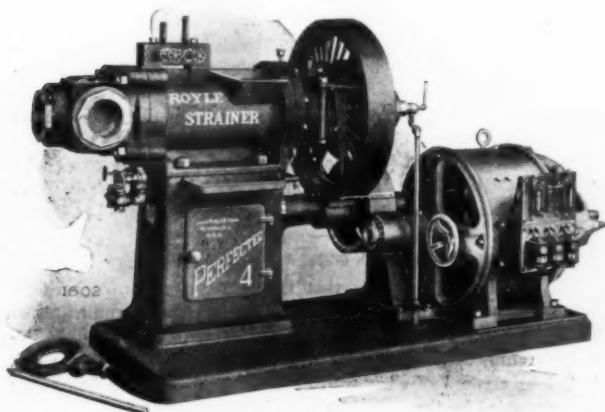


Moreover, in modern practice its use is more or less sentimental and rather unpractical, for the steam turbine has long ago proved its superiority in the production of power.

The engineering executives of the large rubber factories have not failed to appreciate the many advantages of the modern steam turbine, and several installations have been made in the larger mills. The accompanying illustration shows a steam turbine and generator in operation in the plant of the Firestone Tire & Rubber Co., Akron, Ohio. This turbine has a maximum capacity of 10,000 kilowatts [13,333 horse power]; the steam consumption is approximately 14 pounds per kilowatt, through a range of $\frac{3}{4}$ load to $1\frac{1}{4}$ load. The turbine is operating on 175 pounds steam pressure, 50 degrees superheat, and exhausting into a surface condenser under $28\frac{1}{2}$ -inch vacuum, and generating at 2,200 volts. The air for generator is passed through a modern type of air washer, thus giving very much lower temperature rise on the generator. [The General Electric Co., Schenectady, New York.]

A NEW THREE-WAY DELIVERY HEAD STRAINING MACHINE.

In reclaiming devulcanized rubber and the preparation of new rubber, particles of fiber, metal and other impurities are re-



moved by a mechanical straining process. Where large capacity that requires continuous, high-speed operation is desired the

three-way delivery type of straining machine is recommended.

The illustration is that of a 6-inch, self-contained strainer, equipped with motor-drive, automatic self-starter and stock-worm cooling device. It is built in accordance with the well-known excellence of design, material and workmanship characteristic of all Royle products.

The large straining area provided in this multiple head and the simplified straining parts that may be quickly interchanged are salient features in securing a maximum production. No less important is this specially constructed stock-worm and hopper proportionately designed to handle large quantities of material without clogging the machine.

To insure perfect alignment and efficient operation of the rapidly moving parts, the machine, out-board bearing and motor are mounted on a continuous bed-plate of substantial construction.

Rubber compounds vary in composition, requiring different stock-worm speeds in order that the maximum straining capacity may be attained at all times. This is obtained by a standard form of variable speed motor drive that is shown in the illustration. [John Royle & Sons, Paterson, New Jersey.]

HAND AND POWER BRUSHES FOR RUBBER WORKERS.

That brushes of various sorts are used in the rubber mills is generally accepted as a fact of comparatively minor importance. But upon investigating the subject it would appear from the variety of standard sorts in use, and the many types designed for special purposes,



that the brush problem in a rubber mill is by no means the least in importance.

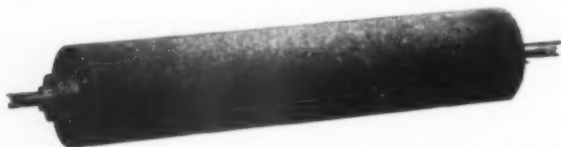
There are, first, the hand brushes such as the counter, bench and floor brushes, that are made of good stock and in such a manner as to conserve their usefulness and not shed the bristles. Fine steel wire hand brushes with bristles of round tempered wire suitable for cleaning molds, cores and metal surfaces are made in accordance with the particular use for which they are intended.

Power brushes are of the rotary type and are principally used by tire manufacturers for roughening the casings before cementing and applying the tread. The bristles are of carbon steel wire and are made in sections which when worn out may be readily replaced. The complete wheels with brass or steel hubs are furnished in sizes varying from $6\frac{1}{2}$ to 15 inches in diameter and from $1\frac{1}{2}$ to 3-inch face. Of this type are the special rotary steel



brushes operated on a buffing stand or flexible shaft drive for cleaning tire molds and cores. They are made in different sizes and shapes with bristles soft or stiff according to the work required of them. Special rotaries are made as small as 3 inches and as large as 36 inches in diameter, with faces as wide as 6 inches.

The spreader brush is set up at the end of a spreading machine and is driven by chain gearing from the main drive. Its province is to dust the starch from the rubberized fabric as it passes

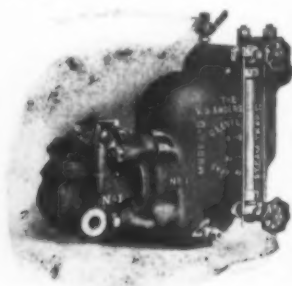


from the spreader to the wind-up roller. These brushes are made with soft bristles, about 8 inches in diameter and 48 to 70 inches long, depending on the width of the spreader.

There are, of course, other brushes that are included in the general list of factory supplies, but the foregoing types are of greater importance and therefore more interesting. [The Osborn Manufacturing Co., Cleveland, Ohio.]

THE ANDERSON FLOAT-TYPE STEAM TRAP.

The successful operation of vacuum chamber dryers, vacuum rotary dryers and fabric dryers used by rubber manufacturers and reclaimers for drying rubber and fabrics depends in great measure upon the efficiency of steam traps. A float trap, which has a greater capacity than is actually needed in order to take



care of any variation, is usually specified. It is, moreover, advisable and almost necessary to have an individual trap on the steam line from each separate dryer; otherwise there will be back-pressure and the condensation will not drain properly. The heating element in vacuum chamber dryers, used in this country and abroad for drying rubber as it comes

from the washers, consists of hollow steel shelves. Steam passes into these shelves, and if any steam is condensed the water must be properly drained in order to make every square inch of the heating surface effective and to insure maximum and uniform drying of the rubber. The steam trap is placed underneath the dryer and connected with a special header that communicates with each of the shelves and drains any condensation that may collect.

Vacuum rotary dryers are used throughout the world for drying reclaimed rubber. They have a steam jacket in the outer shell, and concentric with a hollow revolving drum, also steam heated. A trap is provided for the steam jacket and a hollow shaft to remove the condensation.

Special fabric dryers are equipped with individual traps which operate in practically the same manner as those described in connection with vacuum chamber dryers.

The trap shown in the accompanying illustration is a typical float trap that is well and favorably known to the rubber trade. Its operation, briefly described, is as follows:

The condensed water enters the trap at the point marked "Inlet" and when sufficient accumulates to seal the valve with at least three or more inches of water, the float then raises and opens the valve, allowing the condensed water to escape at just the right rate to take care of the amount entering the trap, thus maintaining a water seal at all times.

After the trap has been in use a short time it is advisable, especially on new piping, to remove the sediment strainer and remove the accumulation of scale and chips.

The trap may be connected to several dryers with good results, provided a uniform steam pressure is maintained at all times. It is always advisable when making up a connection of

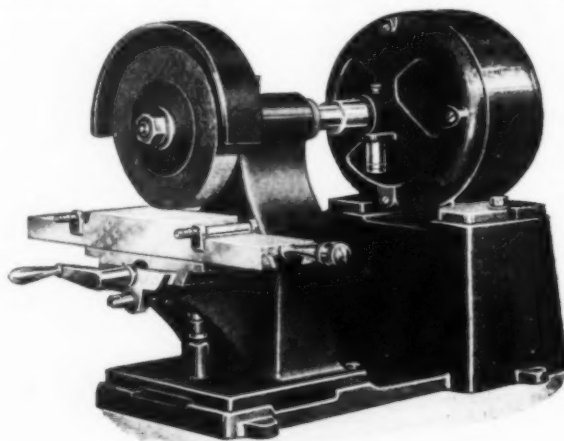
this kind to run the several drips into a large header and attach the trap to the header, which has the effect of equalizing the pressure to a certain degree and produces better results.

When the pressure varies to any extent in the dryers the one having the highest pressure will discharge freely and back up into those having a lower pressure, and the best results can be obtained only by attaching separate traps to those having lower pressure.

A very common trouble with steam traps is caused by low places or pockets in the piping system. Water accumulates in the low spots and is forced through into the trap at intervals, causing an uneven discharge. Where the quantity of accumulated water is sufficient and the steam valve in the line is opened suddenly this water is forced through the pipes at such a high velocity as to cause a water hammer which is very destructive to the whole piping system. [The V. D. Anderson Co., Cleveland, Ohio.]

MOTOR-DRIVEN TEST-PIECE GRINDER.

In making tensile strength tests of the rubber or fabric materials that are used in the construction of tires, hose, belting, etc., the sample should be absolutely uniform in cross section.



This is usually done on a small bench grinder with an abrasive wheel. The original machine of this type, designed primarily for grinding hose-lining test-pieces, was illustrated and described in THE INDIA RUBBER WORLD December 1, 1914.

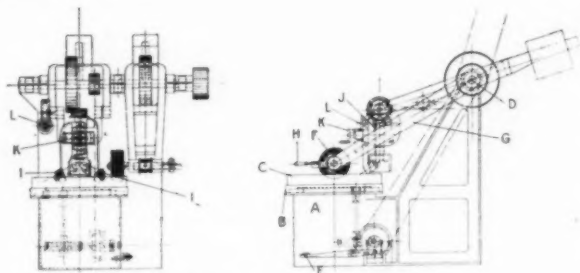
The latest machine, shown in the accompanying illustration, has been improved to meet the requirements of modern rubber laboratory practice. The machine is direct connected to a 1/4-horse-power electric motor and mounted on a continuous bed plate. The ends of the test-piece are clamped by eccentric rollers that hold the strip firmly against the platen. The platen is provided with hand-operated screws for vertical and transverse adjustments. The test-piece is ground by moving the platen longitudinally under the revolving emery wheel by means of the projecting handle and it is moved transversely by the cross feed handle shown in the illustration. [Emerson Apparatus Co., Boston, Massachusetts.]

TIRE MOLD AND CORE CLEANING MACHINES.

The mechanical progress that is being made in tire building follows closely the increasing demand for greater production of automobile tires. The hand labor of yesterday is rapidly becoming eliminated by modern time-saving machinery. The old, laborious method of cleaning tire molds and cores by hand may be superseded by the ingenious machines here shown.

Referring to the drawing, the base *A* supports the table *B*, on which rests the mold *C* that is to be cleaned. The table

and mold are rotated by an internal gear and pinion driven by worm gearing from the main drive shaft *D*, and controlled by a friction clutch operated by the treadle *E*. The large rotary wire brush *F* revolves in the lower end of a swinging arm *G*, and is driven by a belt from the main drive shaft *D*. The brush is moved laterally to accommodate different sized molds by a hand lever *H*.

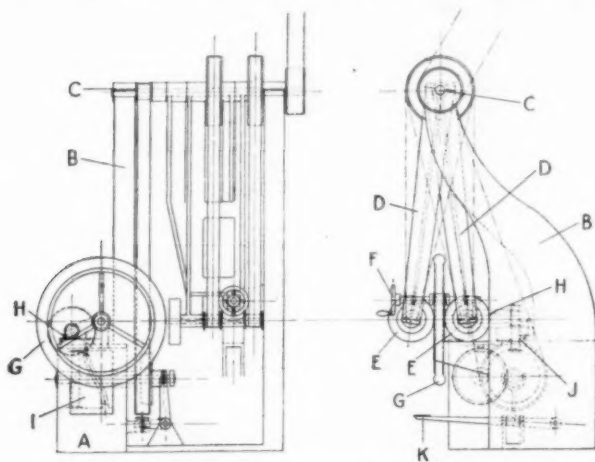


TIRE MOLD CLEANING MACHINE.

The two small brushes *I, I*, are supported on arms that swing around the vertical shaft *J*, the angle of the brushes being adjusted by hand-wheel *K*. Adjustments for different mold sizes are obtained by worm gearing operated by hand-wheel *L*. All the mechanism is fulcrumed on the main drive shaft *D* so that the large and small brushes may be raised when placing or removing a mold on the table.

The core cleaning machine is mounted on a base *A* provided with housings *B* that support the main shaft *C*, upon which are fulcrumed the swinging arms *D, D*. The two belt-driven, rotary wire brushes *E, E*, are journaled in the ends of the swinging arms, and are held in a central position by a bracket, and adjusted by a right and left hand screw operated by hand-wheel *F*.

The core *G* is mounted on a carriage *H* that is moved backward and forward by a face cam *I*; meanwhile the core is being rotated by worm gearing *J*. A friction clutch operated by treadle *K* controls the movement of the core and carriage, while the brushes run continuously. Instead of mounting the core on the spider,



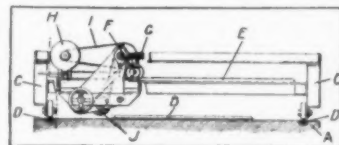
TIRE CORE CLEANING MACHINE.

two concave driving pulleys below, with one concave idler pulley above, may be utilized to drive the core, thereby avoiding the time necessary in chucking the core on the spider. Both mold and tire cleaning machines shown in the drawings are operated by belt-power. This, however, is optional, as motor drive may be installed with an additional cost that in most cases is deemed negligible. [R. W. Wheeler, Cleveland, Ohio.]

MACHINERY PATENTS.

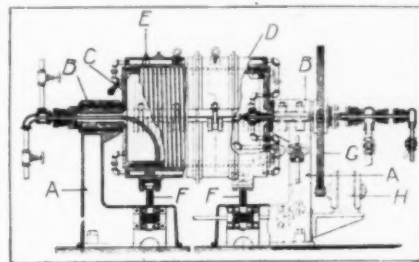
AN OVERFLOW TRIMMING MACHINE.

THE object of this machine is to remove the surplus material from rubber or composition heels, soles and similar molded articles while in the molds. It is here shown in side elevation, mounted on a table *A*, upon which are placed the molds *B*, containing the articles to be trimmed. The rectangular frame *C* is supported on rollers that travel on tracks *D*, permitting movement across the table of the frame on which the carriage is mounted. The carriage comprises two parallel racks *E* and pinions *F*, driven by worm gearing *G* from the electric motor *H* by means of belt *I*. The trimming roller *J* is journaled in pivoted bearings, and adjustable to increase or diminish the friction of the roller in the trimming operation, and also to compensate for different mold thicknesses. The roller is covered with rubber, or any suitable abrading material may be used. It is driven by a crossed belt from the motor countershaft, and as the carriage traverses the table, the roller revolving in the opposite direction removes the overflow. Upon successive shifts of the frame at each traverse of the carriage all the rows of molds may be successively trimmed. [Harry D. Garber, Stoughton, Massachusetts, assignor to Plymouth Rubber Co., Canton, Massachusetts. United States patent No. 1,208,944.]



MACHINE FOR VULCANIZING HOSE IN CONTINUOUS LENGTHS.

The drawing is a side elevation showing the machine partly in section, mounted on end frames *A, A* that support the bearings *B, B*, of the hollow drum *C*, which is surrounded by a cylindrical, chambered jacket *D*. The contacting cylindrical faces of both the drum and jacket are provided with spiral grooves *E*, forming a continuous mold cavity for receiving the hose to be vulcanized in continuous lengths.



The jacket *D* is formed in two half-sections that the upper one may be removed when the hose is placed on the drum or when being removed after vulcanization, the lower section of the jacket being supported in the meantime by two jack screws *F, F*. To effect uniform curing the drum and jacket are rotated by the large gear *G*, driven by the motor *H*, the jack screws being lowered during this operation.

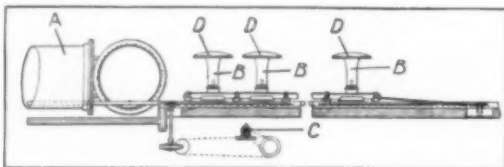
Connections for supplying steam to the interior of the drum and jacket are provided, also means for applying air under pressure within the hose during the vulcanizing operation. [Sarah D. Hewitt, Buffalo, New York. United States patent No. 1,210,938.]

A HORIZONTAL PRESS VULCANIZER.

The novelty in this vulcanizer as compared with the vertical type consists in accessibility of the operating parts and means for more quickly charging and discharging the tire molds. Moreover, the boltless molds are piped individually, permitting the use of inward or outward pressure in the vulcanizing process.

The drawing represents a side elevation of the apparatus, which consists of a horizontal heater *A*, and a train of press cars *B, B, B*, that are coupled together and moved in and out of the heater by an endless chain gearing driven by the motor *C*.

Each press car includes a platform mounted on flanged wheels, upon which the boltless tire molds are stacked. The under part of the platform is formed with a shallow cylinder of relatively

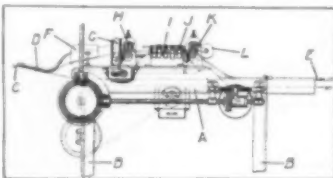


large diameter in which reciprocates a hydraulic ram. The mushroom-shaped press head *D* connects with the upper end of the ram by a screw joint so that it may be removed when the molds are being loaded or unloaded from the car.

In operation the press heads being removed, the molds are stacked on the cars and connected to the internal pressure supply line. The heads are then lowered, the stems traversing the interior of the mold stack, and screwed to the ends of the rams. Pressure is thus successively applied until the molds are completely closed, when the cars are run into the heater and pressure is applied to the interior of the tires. The vulcanizer head is then closed and the tires cured in open steam. [John R. Gam-meter, Akron, Ohio, assignor to The B. F. Goodrich Co., a corporation of New York. United States patent No. 1,210,926.]

TUBE MAKING MACHINE.

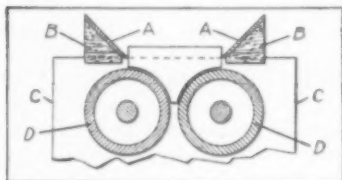
Inner tubes for tires or tubes for making rubber bands are made on this machine from a strip of uncured rubber sheet. The accompanying illustration, which is a side elevation of the machine partly in section, shows the frame *A* supported on suitable legs *B B*. The endless carrier belt *C* delivers the rubber strip *D* on to the machine and carries away the finished tube *E* at the back of the machine.



The tube forming strip is doubled and the edges are cemented by a device on the left not shown in the drawing. On entering the machine the strip is directed to a vertical plane by a guide *F* and then passed between vertical rollers *G*. On emerging, it is received between two horizontal rollers *H*, which flatten the strip in a horizontal plane with the cemented edges butted together. The tube then passes over a raised bed *I* and under four rapidly moving percussion hammers *J* which weld the edges of the tube together. Within the tube and directly under the hammers is a floating mandrel which separates the walls of the tube as it moves over the anvil. The tube then passes between the horizontal delivery rollers *K*, and deflected by idler roller *L*, it is removed from the machine by the carrier belt. [John R. Gam-meter, Akron, Ohio, assignor to The B. F. Goodrich Co., a corporation of New York. United States patent No. 1,210,455.]

SAFETY GUARD FOR WASHERS AND MILLS.

This invention has for its object an improved guard especially applicable to grinders, mixers and washers and which will afford effectual means for preventing the hands of the operative being crushed between the rolls without interfering with the feeding of the material.



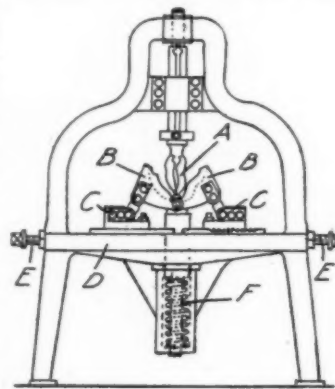
Referring to the drawings, the guard comprises a member *A*, con-

sisting of a length of wood, having attached to its ends triangular pieces *B*, whereby it is supported at an inclination on the side frames *C, C* in which the rolls *D, D* are mounted. Conveniently the triangular pieces *B, B* may be such that the member *A* lies at an inclination of about 45 degrees.

The two guards are arranged on the side frames *C, C* so that the members *A, A* incline outwardly with their lower edges approximately central of the rolls *D, D* and at an appropriate distance of about two inches, above the peripheries of the rolls. The spaces between the lower edges of the guards and the rolls are sufficient to permit the passage of a normal thickness of material under treatment. If the operator who is feeding the material to the rolls should pass his hands too far over the top of either roll, they will come into contact with the corresponding guard and his attention will thereby be called to the fact. [L. Gaisman and S. Dreyfus, both of Manchester, England, British patent No. 101,325.]

MACHINE FOR MOLDING HOLLOW RUBBER ARTICLES.

This machine forms hollow articles of rubber as doll bodies, rubber bulbs, etc. It is simple, easily adjustable, and can be controlled manually. By means of a hand lever attached to the vertical spindle the male die *A* can be raised or lowered. The two hinged portions forming the female die *B* are connected by toggle joints to the bases *C*, which are fastened to the lower platen *D* by set screws, or can be adjusted by screws *E*.



As the upper die is forced downward, the two segments of the lower die are forced together, and thus the article is shaped. As the upper die is released the lower one opens, due to the pressure of the spring *F*. The two dies can be changed very easily, and a variety of hollow objects may be produced. [Karl Jeffers, 44 Udestedtstrasse, Erfurt, Germany. German patent No. 638,713.]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

- 1,208,777. Apparatus for making annular tubes. S. C. Hatfield, Baltimore, Md.
- 1,209,161. Fabric distorting device for tire building machines. H. J. Hoyt, assignor to Morgan & Wright—both of Detroit, Mich.
- 1,209,162. Vulcanizing apparatus. H. J. Hoyt, assignor to Morgan & Wright—both of Detroit, Mich.
- 1,209,202. Tire mold. H. Raffovich, New York City.
- 1,209,308. Apparatus for molding objects by pressure. E. Lanhofer, Foissy, France.
- 1,209,536. Tire builder's tool. C. A. Arnold, assignor to The Hartford Rubber Works Co.—both of Hartford, Conn.
- 1,209,607. Mold for non-skid treads. J. H. Michelin, New Brunswick, assignor to Michelin Tire Co., Milltown—both in New Jersey.
- 1,209,671. Form for vulcanizing footwear. M. H. Clark, Hastings-Upon-Hudson, N. Y., assignor to Boston Rubber Shoe Co., Boston, Mass.
- 1,209,731. Footwear pressure cure apparatus for vulcanizing. C. Lee, assignor to The Goodyear's Metallic Rubber Shoe Co.—both of Naugatuck, Conn.
- 1,209,764. Pressure cure vulcanizing apparatus. E. W. Rutherford, Naugatuck, Conn., assignor to Boston Rubber Shoe Co., Boston, Mass.
- 1,209,779. Tire building apparatus. R. L. Taft, assignor to The Hartford Rubber Works Co.—both of Hartford, Conn.
- 1,209,903. Machine for constructing laminated cohesive interwound bands having varying limits of elasticity. L. A. Subers, East Cleveland, Ohio.
- 1,210,001. Wire-covering machine. F. S. Randall, Jersey City, assignor of one-third to L. L. C. Gooding, Summit, and one-third to C. V. Yates, Jersey City—both in New Jersey.

- 1,210,101. Pressure cure vulcanizing apparatus. C. J. Randall, assignor to The Goodyear's Metallic Rubber Shoe Co.—both of Naugatuck, Conn.
- 1,210,154. Process of and means for making tire reliners. J. L. G. Dykes, Chicago, Ill.
- 1,210,420. Last molding apparatus. G. C. Clark, Mishawaka, Ind.
- 1,210,421. Last molding apparatus. G. C. Clark, Mishawaka, Ind.
- 1,210,902. Apparatus and method of manipulating and handling rolls of fabric. E. B. Cederstrom, assignor to Morgan & Wright—both of Detroit, Mich.
- 1,211,256. Tire stripping machine. W. C. Stevens, assignor to the Firestone Tire & Rubber Co.—both of Akron, Ohio.
- 1,211,370. Extrusion machine. R. B. Price, New York City, and W. J. Steinle, Elmhurst Heights, N. Y., assignors to Rubber Regenerating Co., Mishawaka, Ind.
- 1,211,827. Tire winding machine. W. R. Denman, assignor to The Miller Rubber Co.—both of Akron, Ohio.
- 1,211,886. Convertible tire mold. H. J. Smith, New Castle, assignor of one-half to J. S. Wilson, Pittsburgh—both in Pennsylvania.
- 1,211,918. Tire building core. H. Z. Cobb, Winchester, Mass., assignor to United States Rubber Co., New Brunswick, N. J.
- 1,212,016. Dental vulcanizer attachment. T. T. Carter, Columbus, Kans.
- 1,212,207. Tire stitching machine. R. Griffith, assignor to The Miller Rubber Co.—both of Akron, Ohio.
- 1,212,457. Mechanical expansion mold. B. Darrow, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
- 1,212,643. Fabric coating, drying and solvent recovery apparatus. C. F. Hopewell, Newton, Mass.
- 1,212,725. Mold for vulcanized rubber dental plates. G. M. Wolpe, Indianapolis, Ind.

THE UNITED KINGDOM.

- 11,729 (1915). Elastic tires and apparatus for making. E. A. Muskett and Rubberine, Limited, Campbourne Works, High street, Hornsey, London.
- 12,002 (1915). Latex coagulating apparatus. J. Schadt, Medan, Dutch East Indies.
- 12,128 (1915). Tire tread vulcanizer. E. Nall, Akron, Ohio.
- 12,356 (1915). Sectional core for tire molds. J. H. Coffey and J. H. Coffey, 73 Jameson avenue, Toronto, Ontario, Canada.

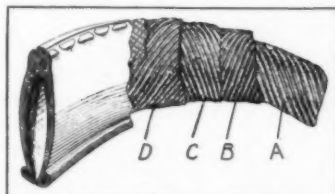
THE FRENCH REPUBLIC.

- 481,170 (March 13, 1916). Improvements in machines for cutting and handling strips of rubberized fabric. Firestone Tire & Rubber Co.
- 481,171 (March 13, 1916). Improvements in tables used in manufacturing inner tubes for pneumatic tires. Firestone Tire & Rubber Co.

PROCESS PATENTS.

THE MILLER CORD TIRE.

SEVERAL layers of rubber-impregnated cords are wound spirally around an annular core. The carcass is then slit on the inner circumference and removed to a second core on which the tire is completed. The process consists in first applying a coating of cement to the core upon which the cords of the first-ply *A* are wound at a definite angle. They are spaced apart at the tread portion



tion and nearly in contact along the inner circumference of the core.

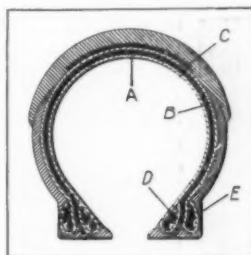
A coating of rubber is then applied to the first ply and a second cord ply *B*, is laid on the first at a reverse angle. This procedure is repeated until a structure is built up having four alternately superposed plies, *A*, *B*, *C*, *D*, of cords embedded in rubber and arranged at reverse angles in respect to one another. The carcass is then slit and placed on a core where the tire is finished and subsequently placed in a mold and vulcanized under pressure. [Walter R. Denman, assignor to Miller Rubber Co.—both of Akron, Ohio. United States patent No. 1,210,434.]

MOLDING FOUNTAIN PEN BARRELS. A tube of unvulcanized rubber of the desired size and shape, containing a small quantity of water, is closed at each end by plugs of raw rubber. The tube is then inserted in a mold which is placed in a vulcanizer and the tube vulcanized in the usual manner. The heat converts the water within the tube into steam which forces the raw rubber

against the mold, giving the desired shape to the tube. [Herman Rickman, Butler, New Jersey. United States patent No. 1,210,842.]

THE ARCHER CORD TIRE.

The straight side casing is made up of inner transverse cords *A*, that fit within the intermediate longitudinal cords *B*, on which are superposed transverse cords *C*. The ends of the inner



cords are looped over cable strips *D*, formed by strips of frictioned fabric doubled around annular wire cables. The longitudinal cords *B* are interposed between the inner and outer cord layers. The outer transverse cords *C* are looped over cable strips *E*. In the clincher casing the inner cords are bulged inwardly and looped over an inner cable strip and then passed over the ends of the outer cords and looped over the outer cable strip. [Charles L. Archer, Minneapolis, Minnesota. United States patent No. 1,211,035.]

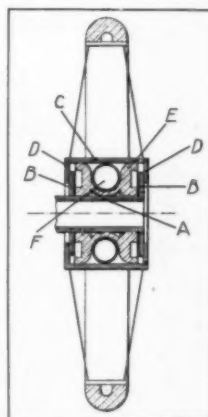
OTHER PROCESS PATENTS.

THE UNITED STATES.

- 1,209,118. Process of making doll heads. A. Chatelain, Akron, Ohio, assignor to the Mechanical Rubber Co., a Corporation of New Jersey.
- 1,209,268. Method of making an inner tube for tires. H. Dech, assignor to Mercer Tire Co.—both of Trenton, N. J.
- 1,209,643. Method of drying materials. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.
- 1,209,644. Manufacture of hollow rubber articles. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.
- 1,211,228. Manufacture of articles embodying fibrous filaments and vulcanizable plastics. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.
- 1,211,350. Method of making conveyor belts. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.
- 1,211,351. Process of manufacturing rubber articles. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.
- 1,211,487. Method of treating sheets of vulcanizable plastics. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.
- 1,211,962. Rubber boot or shoe and process of manufacturing same. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.
- 1,212,098. Method of manufacturing articles of synthetic composition. E. P. Nicholson, New York City.

MISCELLANEOUS PATENTS.

A FRENCH PNEUMATIC WHEEL.



IN this wheel the pneumatic arrangement is placed in the hub. To the sleeve *A*, two annular disks *B* are attached and casing *C* forms an outside cover. To this are attached two disks *D* completely enclosing the hub. In this space is arranged a pneumatic cushion *E*, of suitable thickness (one or two centimeters at the utmost) and of variable diameter, enclosing an air tube *F*.

The spokes of the wheel are attached to the periphery of the hub, and the disks *B* and *D* may be four or more in number and attached alternately to the hub *A* and the cover *C*.

The pneumatic device is concentrically enclosed in the hub, and turns with it and with the wheel. [J. Greppi and A. Romanach. French patent No. 481,036.]

New Goods and Specialties.

PINEAU'S CAPE COD PNEUMATIC LIFE SAVING BELT.

LIFE saving devices for use on the water have been invented in great number and variety for many years, but there still remains a place for a device affording adequate protection and safety without inconvenience to the wearer. In Pineau's Cape Cod Pneumatic Life Saving Belt it is claimed that this desirable combination of qualities has been effected. When inflated it contains enough air to float two people weighing 150 pounds each, and when not in

service it can be deflated, rolled into a compact package, and carried in the pocket or grip, taking up less room than an ordinary vest.

To those who cannot swim and like canoeing and boating it affords ease of mind without bodily discomfort, being readily adjustable to the body by side fastenings, and worn either under or outside the clothing. It is also a satisfactory aid in learning to swim, since it allows perfect freedom of the arms for any kind of stroke while preventing the novice from sinking below the surface of the water.

All sizes are furnished, up to 44 inches, the proper measurement being four inches larger than the chest, to allow for inflation. [Athol Manufacturing Co., Athol, Massachusetts.]

CREPE RUBBER FLOWERS.



Rubber lends itself readily to the life-like representation of flowers and other ornaments, and has been utilized in this manner for various purposes a number of years. A new departure is shown in this spray of Ascension lilies, fashioned from unvulcanized crepe rubber. This is but one of a large variety of reproduced blossoms. The slightly crinkled surface of this form of rubber aids in the realistic effect, and the

flowers, be they lilies, morning glories, poppies, hibiscus, or any other blooming plant, are tinted in the natural colorings. As hat trimmings, corsage bouquets, accessories for bathing costumes, etc., a surprising number of effective uses are found for these attractive novelties. [O. H. Hurley, New York City.]

PAPE "THERAPHONE" RECEIVER EARPIECE.

The improved earpiece here shown, when substituted on a telephone receiver for the ordinary earpiece, is claimed to render sound reproductions clear and natural instead of fatiguing, harsh and confusing. The "Theraphone" earpiece is made of hard rubber, with a true diaphragm seat which prevents all rattling of the receiver membrane. The inverted trumpet-bell tone chamber does not readily collect dust and dirt when the receiver is suspended from its hanger, and is therefore thoroughly hygienic. The radially fluted trumpet-bell ear chamber fits the ear comfortably and prevents the emitted sound waves from becoming muffled, and a rearward tapering periphery prevents the threaded portion of the earpiece from striking the table line when the receiver is laid on its side for waiting purposes. [The Evolution Phone Co., Inc., New York City.]



TIRE REPAIR PREPARATIONS.

"Pluggum" is the suggestive name for a soft, pliable rubber gum that is applied by simply kneading it into the cut in the tire with thumb and forefinger. It is claimed that this quick-repair gum will be permanently cured into place by the heat of the running tire. [The Miller Rubber Co., Akron, Ohio.]

A new rubber cement now on the market is claimed to be the only vulcanizing cement that dries in 30 seconds and that can be used either for cold patching or vulcanizing with a gasoline or steam vulcanizer in three minutes. Many preparations of this character lose their adhesive quality under the heat caused by the friction of the tube and casing when the car is running, but the slogan for "Vulcanite Cement" is "The Hotter It Gets the Better It Sticks." It is guaranteed not to be affected by either heat or cold and is suitable for repairing any article made of rubber. [Withrow Rubber Co., Grand Rapids, Michigan.]

MOISTURE-PROOF ATTACHMENT PLUGS.

The purpose of the rubber pieces here shown is to make possible the use of separable attachment plugs outdoors, without danger of short circuiting when exposed to rain. The plug cap is set into the rubber casing and the rubber ring is mounted on the porcelain base just above the threaded portion, which screws into the socket, as indicated in the lower illustration. When the plug is inserted in the socket, the rubber ring is held tightly between the shoulder of the plug and the edge of the socket, making it impossible for any moisture to come in contact with the metal screw shell of either plug or



socket. The cap covered with the rubber casing is then inserted in the plug, making it thoroughly weatherproof. [Harvey Hubbell, Inc., Bridgeport, Connecticut.]

BALANCED WHIP GOLF CLUB.

As every player knows, the game of golf is not as easy as it looks, but requires the most practiced skill to attain any degree of proficiency. Every improvement in the accessories is eagerly sought by devotees of the game, but while the golf balls of to-day are much more resilient and better than those formerly in use, the chief improvement in clubs has been in the appearance and greater range of selection, the matter of distance and control remaining practically the same.

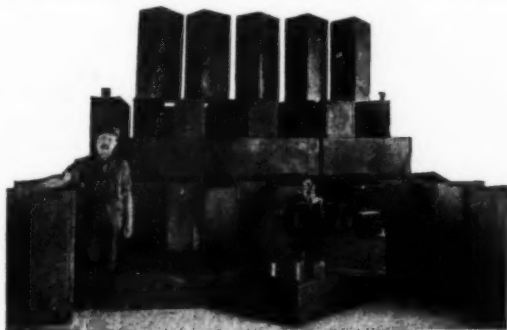
An interesting departure is shown herewith in a golf club embodying decided improvement in these qualities. A piece of rubber inserted in the shaft's upper half gives a controlled flexibility which makes it whip only one way, in the direction the ball is driven, instead of up or down or in a circle, in the provoking manner of ordinary clubs. It is claimed that the perfect balance of this club makes it feel lighter and swing with greater freedom and more force, and this, together with the whip, enables the player to gain greater distance and accuracy. It is also said to prevent the breaking of the club at the head, and when played in the rough, striking stones or turf, the whip breaks the shock and almost invariably saves the club.

These clubs are made in a large variety of weights and styles, including all kinds, from driver to putter. [Balanced Whip Golf Club Co., New York City.]



HARD RUBBER SUBMARINE JARS.

A large percentage of the submarines used by the government has sulphuric acid batteries, and hard rubber jars are required to encase them. The accompanying illustration shows a number

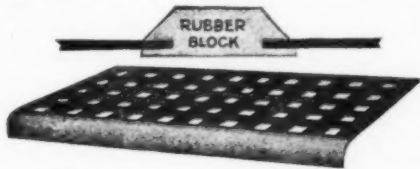


of such jars that are made especially for the United States Government. They measure approximately 12 by 17 inches by 3 feet high, with walls 3/8 of an inch thick. [The Luzerne Rubber Co., Trenton, New Jersey.]

FLOOR TREADS AND MOTOR-CAR COVERS.

The patent safety tread here shown consists of rubber blocks, vulcanized in galvanized steel, brass or other malleable metal plate and forming a raised pattern. For stair treads and office door mats this device is highly satisfactory, being neat in appearance, noiseless, and affording an absolutely safe foothold.

Waterproof motor-car covers are also furnished by the same



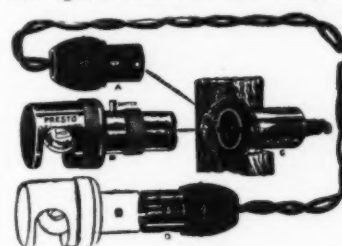
manufacturer which completely cover the car. These are supplied in black and drab proof sheetings, also blue, black or fawn Paramatta cloth. A canvas bag for packing the cover when not



in use is provided. [The North British Rubber Co., Limited, Edinburgh, Scotland.]

COMBINATION DASH AND TROUBLE LAMP.

In ordinary use, this device is a dash lamp, suitable for any car, to illuminate the speedometer, vibrator, clock, pedals, etc. The light is turned on and off by means of a two-way socket.



A threaded lock nut on part B holds the lamp head securely in the dash socket, preventing all rattle and wear of parts.

When desired, it can be converted into a trouble lamp by simply removing the lamp socket B from the dash socket C, using the ten feet of cord fitted with Bayonet plug and socket. The plug A is then connected to the socket D on the dash and the other end to the reflector and lamp B.

These lamps are finished in nickel-plate, the lamp socket and plugs being made of hard rubber, forming the insulating material, and also supporting the metal plungers and metal contact points which complete the circuit with either the lamp bulb or the plug, as the case may be. [Metal Specialties Manufacturing Co., Chicago, Illinois.]

MARSHALL'S LINEMEN'S SHOE.

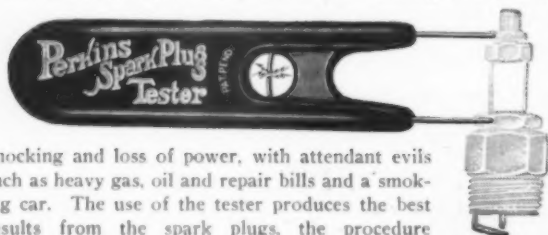
The lineman's calling is a dangerous one and its followers must be fully protected against electric shock. The shoe here illustrated is said to afford absolute protection, on the poles, on the ground, or in manholes, against pressure up to 20,000 volts. This shoe is vulcanized into a solid piece, will not peel nor come apart, and is not affected by oil, gasoline nor grease. The outer surface is of tough red rubber, the outer sole of white, wear-resisting, vulcanized tire-tread rubber. Above an insulated sole of red rubber extending two inches above the heel is a non-moisture absorbing cushion, and the lining of the shoe is embedded in rubber to prevent absorption of moisture. The shoe upper is made of "Standwatter" mineral tanned leather, with no glue or grease used in the tanning process. This leather is claimed to be waterproof, current-proof and not affected by heat or cold.



Tests of this shoe in the laboratories of the Edison Electric Illuminating Co., of Boston, Massachusetts, under the direction of the National Electric Light Association, showed the following characteristics: Side of shoe, dry, punctured at 31,500 volts, and again at 34,000 volts; sole of shoe between electrodes in oil, punctured at 55,000 volts; 20,000 volts applied from salt water to salt water for one minute and 30,000 volts applied from salt water to salt water for 45 seconds did not puncture the rubber. [Linemen Protector Co., Detroit, Michigan.]

PERKINS' SPARK PLUG TESTER.

By means of this handy device, which is made entirely of hard rubber, defects in the action of spark plugs may be instantly located. The majority of automobiles have three or four different makes of spark plugs, and in many the plugs are not set at the proper gap and cause uneven running of the motor,



knocking and loss of power, with attendant evils such as heavy gas, oil and repair bills and a smoking car. The use of the tester produces the best results from the spark plugs, the procedure being as follows: Set that gaps are set the same as the gap in the tester. Place the tester with one wire touching the terminal cap and the other wire touching the base of the plug. If the plug is operating as it should, a good spark will result, while a broken porcelain or fouled plug will not show a spark in the tester. [A. D. Perkins, New York City.]

PNEUMATIC SECURITY BOLT.

Although similar in part to the ordinary type of security-bolt for pneumatic tires, the one here shown has the customary metal head with its under seat covered by canvas, this canvas being sealed by a piece of rubber and the two forming a pneumatic cushion which serves to hold the tube well out of the way of both bolt and outer cover when fitting. This special, patented form of security bolt is claimed greatly to minimize the risk in the operation of tire changing, that the covers and tubes will be nipped under the beads of the cover or under the security bolts. [The Self-Sealing Rubber Co., Limited; of Hermetic Works, Birmingham, England.]



A PNEUMATIC WHEEL.

A cushion wheel that disposes of the customary pneumatic tire and tube, comprises a solid tire that is cushioned on eight pistons operating in radial air cylinders. This air cushion wheel is recommended for all motor vehicles using solid tires and also for pleasure cars using pneumatics.



The solid tire is flexibly fixed to the radial pistons that automatically compress the air in the metallic air cylinders which are attached to the hub like spokes of a wheel. Thus it is claimed that the jars and jolts incidental to road travel are absorbed and riding quality obtained equal to that of a pneumatic tire. The tire is obviously immune from

punctures and blow-outs and moreover, it is said that the only attention required is an occasional drop of oil in the metallic air cylinders. [Pneumatic Wheel Co., St. Paul, Minnesota.]

"NEW GIANT" SINGLE-TREAD SOLID TIRE.

Trucks of six and eight-ton capacity demand tires of exceptional size, and the one here shown, measuring 42 by 14 inches, is claimed to be the largest single-tread solid tire ever built.



But size is not the only requisite. Of prime importance, and particularly considered in the construction of this tire, is the building and placing of the rubber in such form as will accommodate the internal stresses and displacement with the minimum friction. The resultant stresses within the distorted portion of the tire immediately affected by the load must also be taken into consideration. In the narrow-section solid tire these lateral stresses are relieved by the sides, but in the giant solid tire the sides are too widely separated for such relief. To meet this condition, the

"New Giant" has a series of grooves, scientifically arranged, encircling the outer periphery, thus making it analogous to a number of smaller tires with the additional advantage of all portions working on a single base. These grooves also tend to prevent skidding and assist tractive effort.

Some idea of the colossal size of this tire may be gained from the positions of the men in the picture, C. E. Speaks, manager of truck tire sales, standing beside it, and L. C. Clough, of the truck tire department, sitting within. [Firestone Tire & Rubber Co., Akron, Ohio.]

RUBBER IN THE FLOTATION PROCESS.

The flotation process of ore separation makes use of the affinity of finely ground sulphide ores for the froth produced by agitating a solution of water containing a very small proportion of an oil.

The sulphide ore is mixed with about 20 parts of the solution and run to cells where it is agitated either by mechanical means or by blowing air through a porous bottom. A number of substances and constructions have been used to form this porous bottom, but the most satisfactory so far, has been the cotton fabric diaphragm. However, the pores of this cotton fabric rapidly fill up and clog from the ore, and hence do not last long.

Rubber-coated diaphragms have been developed to eliminate the trouble experienced from the regular cotton fabric. It is made of one ply of coated fabric and two plies of regular untreated fabric, all stitched together in rows one inch apart in both directions. In the coated fabric, every thread is completely coated with rubber, but the fabric has been produced in such a way as to make it porous, and the small openings are the proper size to produce the froth required. These diaphragms are necessarily more expensive than the ordinary cotton fabric type, but the increased service is considerably out of proportion to the increased cost. [The B. F. Goodrich Co., Akron, Ohio.]

The Editor's Book Table.

THE CHEMISTRY AND TECHNOLOGY OF PAINTS. BY MAXIMILIAN TOCH. Second revised edition. D. Van Nostrand Co., New York City. [Large 8vo, 366 pages. Price, \$4.]

THIS standard work, which has passed through two editions, has been entirely rewritten and practically doubled in size.

It is an important work for manufacturers of paints, but is also of value to manufacturers of rubber goods because many of the materials described therein are used in the rubber industry. It is especially valuable for the chemist and the laboratory worker, inasmuch as it gives very complete directions for the analysis of many of the materials and solvents used in rubber compounding, the determination of relative purity, the detection of adulterations and the methods of manipulation in the manufacture. There are 83 microphotographs, as well as other illustrations. Valuable tables for conversion of French into English weights and measures, specific gravity of various materials, international atomic weights, and comparative thermometer readings, are also included. In all, the book is one which should find a place in the laboratory of every rubber factory.

Mr. Toch calls attention to the occasional employment of rubber in the manufacture of paint, a fact perhaps unknown to some rubber men. "In certain classes of mixed paints, particularly house paints which are made of corroded lead, sublimed lead, barium sulphate, etc., there is a likelihood or tendency of the pigment to settle. . . . To prevent this . . . a manufacturer feels the necessity of adding a combining medium . . . to prevent the paint from settling hard in the package. Among these are gutta percha solutions, solution of balata, Para rubber, gum chicle, etc. The rubber solutions mentioned serve their purpose very well without injuring the paint."

THE INDIA RUBBER, GUTTA-PERCHA AND ELECTRICAL DIARY and Year Book, 1917. MacLaren & Sons, Limited, London, England. [Large quarto, cloth, 150 pages.]

This annual publication which has been of great value to the rubber trade, not only in Great Britain but all other countries, appears this season in similar form to that of former years, and contains the usual statistical information which has made it so valuable in the past. The trade in rubber goods, both domestic and overseas, is carefully compiled and full statistics are given. The trade index is very extensive, occupying 30 or more three-column pages; the figures of the imports and re-exports of rubber are given, and there follow the blank pages for the entry of transactions for each week day for the current year, besides several pages for miscellaneous memoranda. Instead of being interleaved with blotting paper as formerly, several loose sheets are furnished with the book, which is somewhat less bulky and fully as convenient for use. There are a large number of trade announcements, mainly of British rubber manufacturers.

GASOLINE AND HOW TO USE IT. BY G. A. BURRELL, Oil Statistical Society, Inc., Boston, Massachusetts. [281 pages, small 8vo, flexible leatherette binding. Price \$1.50.]

Mr. Burrell, who until recently was in charge of the research laboratory for gas investigations, Bureau of Mines of the United States Government, has performed a commendable work in bringing into this compact handbook a fund of information which is of value to every user of gasoline for motive power, as a solvent, for heating or lighting, for cleansing, or for any other purpose. Precautions for handling, directions for extinguishing fires, directions for detecting the presence of gas, are among the subjects treated, and a large portion of the handbook is devoted to the many points of interest to the automobilist, where engine troubles are treated, and practical directions for overcoming them are given. There is a short section on the use of benzene in the rubber industry. The present shortage of gasoline is con-

sidered, and a history of the petroleum industry embraces a short account of the many refining processes, including the modern "cracking" processes. The extraction of gasoline from natural gas, from shale, etc., is also described. Substitutes come in for description and consideration. Statistics, tables of specific gravity, atomic weights, and nomenclature of the Society of Automobile Engineers are added, making the little handbook a real *rade mecum* for gasoline users.

THE MAINTENANCE OF HEALTH IN THE TROPICS. BY W. J. SIMPSON, C.M.G., M.L., F.R.C.P. William Wood & Co., New York City. [16mo, illustrated, 174 pages. Price, \$1.35.]

American rubber men are instinctively turning toward the plantations of the Far East. Tours of investigation are more frequently chronicled; American capital is already invested in this industry, and more is soon to follow. Thus the American edition of this English publication could hardly have appeared more opportunely. As lecturer on tropical hygiene at the London School of Tropical Medicine, Dr. Simpson is well equipped to deal with this subject, which he has treated comprehensively and concisely in the present volume. The essential information has been presented with the fewest number of words. There are chapters on climate and personal precautions, diet, drinking water, dwelling houses, illnesses of the tropics and their prevention, with special chapters devoted to snake bites and wounds. With this book and the medical equipment advised no man of the north or south need fear for his personal well-being while sojourning along the equator.

NEW TRADE PUBLICATIONS.

THE footwear catalogs of the several factories of the United States Rubber Co. for the year 1917 follow in general style those of previous years, being of the long narrow shape, with handsome covers in colors, each with a distinctive design. They are fully illustrated with large half-tones of all the various styles of boots and shoes, thus, together with the printed descriptions, giving very satisfactory information regarding the goods made in each factory. After showing the styles, a department is devoted to illustrating the shapes of lasts, a side view and a sole view being given, some new shapes being added which are adapted to the latest styles of leather shoes they are intended to cover. The net price-list is given at the end of each book.

As stated above, the covers are distinctive and attractive, those of the Lycoming and "Goodyear Glove" factories bearing neat, well-drawn conventional designs which include the special brand and the U. S. trade-mark. The Boston Rubber Shoe Co. catalog is appropriately decorated with a picture of the Boston Tea Party; the L. Candee & Co. shows a bright lad in a lively shower; the American book pictures a *seringueiro* gathering latex; the Joseph Banigan Rubber Co. presents a couple of automobilists in a snowstorm; the Woonsocket Rubber Co.'s decoration is a fisherman in midstream; the Meyer Rubber Co. contributes a hunter in the wintry woods, while the Wales Goodyear catalog, true to its trade-mark, depicts a polar bear on a cake of ice, with the midnight sun in the background.

Besides these there are the usual net and gross price-lists of the above-named companies, and in addition, net price-lists of knit and felt boots of the Hastings Wool Boot Co. and the Medford Woolen Manufacturing Co., the list of miscellaneous goods, and a special catalog of the Everstick rubbers.

John Royle & Sons, Paterson, New Jersey, is mailing on request to interested persons a well-printed, 20-page, illustrated

pamphlet describing in considerable detail the Royle six-inch straining machine with the three-way delivery head, displayed elsewhere in this issue. The booklet also contains a summary of the Royle tubing machines, insulating machines and circular looms.

From the International Rubber Co., Denver, Colorado, we have received the first issue of "More Mileage," the firm's new monthly trade paper in the interests of International Rubber Half-Sole tires. Its bright reading matter and many illustrations reflect a "get-together" spirit among department heads and representatives that invariably makes for success.

From the B. F. Sturtevant Co., Hyde Park, Massachusetts, comes Binder B, substantially gotten up in red cloth with large titles in gold, in which to file 21 of the company's publications as issued, 7 of them already being in place. Firms having a large and varied product do well to standardize their publications in this manner for the convenience of their customers.

Those equipping rubber factory additions will find interest in the catalogs now available of Sturtevant air washers, Bulletin 226; Multivane volume fans, Bulletin 228; heaters, catalog 230; Autoforce ventilators, Bulletin 232; pneumatic collecting and conveying systems, Catalog 235, and electric fans, Catalog 240.

The Scientific Materials Co., Pittsburgh, Pennsylvania, has sent out "The Chemical Blue Book," a very valuable catalog and price-list of chemicals, acids and alkaloids, reagents, etc., which is likely to be of value to every analytical chemist and rubber manufacturer. This book gives a most complete list of chemical products handled by the company, containing as it does 4,000 different items with their synonyms, chemical formulae and processes. A list of international atomic weights is given, and added to this is a list of Kahlbaum's reagents, both English and German names being given. This company claims to have the largest stock of these reagents in the United States, and this is especially notable inasmuch as no more can be secured until after the close of the present European war.

Those of our readers who have not yet studied the Federal Reserve Act, or who do not fully understand the advantages and the workings of trade acceptances, will find a very informing and interesting explanation in the pamphlet "Trade Acceptances from a Mercantile Viewpoint," by Kenneth R. Hooker, vice-president and treasurer of the Putnam-Hooker Co., Cincinnati, Ohio. The pamphlet can be read in a short time, and gives a thorough explanation of the merits of this plan of merchandising and collections, applicable to all lines of business.

MORE CALENDARS AND SOUVENIRS.

IN addition to the calendars and souvenirs of which mention was made in the January issue of THE INDIA RUBBER WORLD as having been distributed to the rubber trade during the holiday season, it is a pleasure to acknowledge receipt of the following early in January:

SOUVENIRS.

Somerset Rubber Reclaiming Works, reclaimed rubber, Somerset, New Jersey. The most ingenious of the year's offerings, this consists of a white metal clip to hold a filler pad of perforated, detachable memorandum sheets $3\frac{1}{2} \times 4\frac{1}{2}$ inches, each bearing the legend: "What I Am to Do Today." To the thumb-piece of the spring clip is hinged a container for 12 monthly calendar cards beneath a celluloid-covered opening. Thus the calendar may be folded flat for mailing.

The Boston Woven Hose & Rubber Co., mechanicals, belting, packing, carriage cloth and hose, Cambridge, Massachusetts, distributed one of the handsomest souvenirs of the year. It consists of a 36-page octavo volume entitled "The Story of Rubber,"

and is artistically bound in green boards, printed on dull-finish coated paper, with many half-tone illustrations and several handsome inserts in full color, both on the cover and within the book. After describing what rubber is, how it is obtained, and reviewing the rubber industry and the growth of the Boston Woven Hose & Rubber Co., a journey through its great Cambridge plant is interestingly narrated. By word and picture a very good general idea is given the layman of the methods of manufacturing rubber hose, heels and soles, mats and matting, belting, fruit-jar rings and tape, together with a glimpse into the brass foundry where hose couplings and nozzles of all sizes and descriptions are made.

CALENDARS.

The Adamson Machine Co., rubber working machinery, Akron, Ohio. This displayed a beautiful hand-tinted photographic print, the subject being an attractive waterscape.

Boston Belting Co., belting, packing, hose and mechanicals, Boston, Massachusetts. An art calendar in tones of brown, depicting the Forsyth Dental Infirmary for children, donated to the city of Boston by Thomas A. Forsyth, president of the company.

David Bridge & Co., Limited, engineers and rubber machinists, Castleton, Manchester, England. Six sheets illustrating songs of long ago, each sheet having a humorous picture well printed in three colors on pebbled cream tinted paper. "We'd Better Bide a Wee," "The Wearing of the Green" and "The Gipsy's Warning" make particular appeal to the rubber trade.

Electric Hose & Rubber Co., hose, Wilmington, Delaware. Purely utilitarian in the form of a desk pad for memoranda.

The Rubber Regenerating Co., Limited, reclaimers, Trafford Park, Manchester, England. Its features were a daily tear-off pad and a reproduction in color of "The Passing Train," by Lucy Kemp-Welch, a painting of a plowing scene, with four splendid horses.

The Stamford Rubber Supply Co., rubber substitutes, Stamford, Connecticut. A large daily date calendar.

H. F. Taintor Manufacturing Co., whiting, Paris white, chalk, china clay, etc., New York City.

Tyson Brothers, rubber substitutes and chemicals, Carteret, New Jersey. This was the largest and handsomest calendar of the year, the illustration being a superb four-color reproduction of Moran's painting of the "Falls at Toltec Gorge in the Rockies," measuring $16 \times 22\frac{1}{4}$ inches.

Westinghouse Electric & Supply Co., electric motors and control devices, East Pittsburgh, Pennsylvania. A large calendar for practical office use.

CARDS.

Binney & Smith Co., lampblack, New York City.

Essex Rubber Co., mechanicals, hose, tires, tubes and accessories, packing, cements, sporting goods, heels and soles, Trenton, New Jersey.

Goodall Rubber Co., Inc., jobbers, Philadelphia, Pennsylvania. The season's greetings in the form of a blotter.

The Packard Electric Co., insulated wire, Warren, Ohio.

TRADE-MARK DECISION.

The examiner of trade-marks refused registration as a trade-mark the words "Para Oke—A. & A. R. Co. 100% Line," arranged in a circle, for shoe soles and heels, because of prior registration of the trade-mark of the American Rubber Co., which shows the word "Para" and "Boston" below a line on which appears the words "Rubber Shoe Co." for rubber boots and shoes. The court of appeals has decided that in view of the facts that, first, "Para" is descriptive of rubber, and probably of itself is not registrable; second, that the goods of the applicant and registrant are materially different; and, third, that applicant's mark involves its initials, together with the words "Para Oke," which apparently are not descriptive of the applicant's goods, applicant's mark may be passed to issue if no opposition develops.

Interesting Letters from Our Readers.

OCOTILLO VALUABLE AS A COMPOUNDING INGREDIENT.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—My attention was just called to the fact that a clearer explanation should be given about the uses of ocotillo gum, also a reply to the questions asked at the conclusion of the article that appeared on page 75 of the November issue of THE INDIA RUBBER WORLD. The exploitation of ocotillo gum reminds me of a similar experience that I had in 1907, when I worked out an insulating compound using mineral rubber known as No. 620 that answered the underwriters' specifications and kept the cost of the compound down.

In reference to ocotillo gum, L. B. Johnson, of Mesa, Arizona, asked my opinion of it, and I told him I could not give an answer until I had made a few experiments.

The experiments were very satisfactory, as the enclosed sample is a cement stock compound vulcanized 45 minutes at 40 pounds pressure, and composed of smoked sheet, ocotillo gum, M. R. X., zinc oxide, white lead, litharge and sulphur. I used 20 per cent of the ocotillo gum in the compound, and find that it vulcanizes without any objectionable features, as is often true of many new gums.

It provides an excellent gum to add to all friction stocks as it has the valuable power of causing the rubbers commonly used in friction stock to make a better union by penetrating the intricacies of the fabric. This is one of the very valuable characteristics of guayule, long known to the rubber trade.

At first rubber manufacturers did not look on guayule with favor, but today the opposite is true. Ocotillo gum, in conjunction with M. R. X., guayule and a good grade of automobile tire reclaim, produces a remarkably strong adhesive friction stock. Ocotillo has also been found to be a very valuable ingredient in the manufacture of a substitute for leather shoe soles for which there is a great demand; also in cements and repair stocks for automobile tires. Two tires are now in service retreaded with a tread stock compounded with 20 per cent of ocotillo gum and smoked sheet. One of these tires has traveled on the front wheel of a jitney bus over 5,000 miles; the other is on a private car.

Ocotillo gum cannot be used alone in the manufacture of this or similar goods, but it does possess the very valuable property of helping to make a better union, thus preventing separations in many cases, and it has a valuable part to play in the greatest of all businesses, the rubber industry. E. W. SNYDER.

Los Angeles, California, December 19, 1916.

AN ALCOHOLIC POTASH EXTRACTION METHOD.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—Your readers will perhaps be interested in my recent investigations indicating a satisfactory method to pursue when the analysis of vulcanized soft rubber is required for specification, or especially for compound analysis.

A known rubber compound containing 10 per cent sulphide, fatty substitute and 40 per cent rubber, the remainder being sulphur and mineral fillers, was taken for the experiment. As it is necessary to reduce the rubber sample to small particles in order to obtain correct results, this compound was first cut with a pair of scissors into the smallest possible pieces. After acetone and chloroform extraction it was boiled for four hours with normal alcoholic potash solution under a reflux condenser. The fatty acid was then determined in the usual way, and only 45 per cent of the total theoretically expected amount was obtained. Repetition of the same procedure with two more samples yielded simi-

lar results. Another was tried and also cut into small pieces with scissors as before, but was boiled for eight hours with normal alcoholic potash solution, when 56 per cent of the expected amount was obtained.

By taking the same compound, however, breaking it down carefully between mixing rollers, and sifting it through 32-mesh screens, 92.82 per cent of the theoretical value was obtained after acetone and chloroform extraction and boiling with the alcoholic potash solution for only three hours.

Passaic, New Jersey.

D. REPOY.

A MENACE TO THE BOLL WEEVIL?

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR Sir—In your January issue a correspondent writes that the boll weevil, advancing at the rate of 65 miles annually, has now covered half of Florida and threatens the Sea Island cotton crop of Georgia. He has overlooked the fact, however, that the latter state holds the record for annual number of lynchings. Sure and awful treatment is dealt out to pests of every sort; a punishment more terrible than the crime never seems to be wanting, and the boll weevil may well hesitate before penetrating far beyond the Florida boundary. Already the convention of Georgia, Florida and South Carolina cotton growers, to be held at Valdosta, Georgia, to-day, indicates an inclination on the part of the State Board of Entomology to take an active hand in giving this latest offender a warm reception.

Admittedly the boll weevil is a menace that must be fought energetically, but meanwhile let us be hopeful of the future.

OPTIMIST.

New York City, January 24, 1917.

ACCELERATED AGING TESTS NOT YET OF VALUE TO THE CONSUMER.

The stenographic report of E. A. Barrier's remarks on this subject before the Rubber Section of the American Chemical Society, as published in THE INDIA RUBBER WORLD of December 1, 1916, does not exactly agree with Mr. Barrier's opinions on this subject, and it is, therefore, a pleasure to give space to his corrected version which follows:

I am quite sure that every consumer wishes to get all of the cooperation he can from the manufacturer, but apparently this aging test is not yet in a condition where it will be of much value to the consumer. It is very evident that no definite conclusion can be drawn in general as to the probable life of rubber from the aging test. What the consumer wants is a test that is absolutely definite; if a sample shows up well after a few days' exposure, he wants to be sure that it will have a certain number of years of life.

As I understand it, in the accelerated aging test a sample may show good results in a ten-day test, but the ten-day sample may last a shorter time in service than a three-day sample. In other words, the test appears to be of value to the manufacturer where he is comparing compounds of the same type, but it does not seem to be of value to the consumer for general application.

There has been a good deal of discussion regarding this test in connection with insulated wire, and it may be that when used in conjunction with detailed specifications, such as those applying to this class of material, the test would be of value. The specifications call for certain chemical and physical requirements which limit the manufacturer to a considerable extent as to the character of compound which he can use. Under such conditions, where chemical and physical requirements are retained in conjunction with the aging test, it may be that the latter test is of value. On the other hand, it certainly is not clear that the aging test has developed to a point where it can be used as a substitute for the ordinary chemical and physical requirements which now generally appear in specifications. It is possible that a study of chemical tests on samples which have been subjected to the aging test will still further enhance its value.

The Obituary Record.

ONE OF THE OLDEST RUBBER MEN IN THE WEST.

JOHAN M. MILLER, for over 10 years manager of the St. Louis, Missouri, branch of the Goodyear Rubber Co., New York City,



J. M. MILLER.

died January 2 as the result of a paralytic stroke. The St. Louis store was opened over half a century ago under the management of George B. Thompson, who employed Mr. Miller as bookkeeper 45 years ago. In 1906 Mr. Thompson died, and Mr. Miller, then assistant manager, became his successor. For 15 years past Mr. Miller has suffered from rheumatism, but his indomitable energy and desire to expand the business have kept him active. About six

weeks before his death a paralytic stroke confined him to his home, and he died upon the second occurrence.

Mr. Miller's long association with the trade had made for him many acquaintances and friends throughout the United States, all of whom will be glad to know that Fred Sheppard, president of the company, has appointed Paul Miller to succeed his father in the store which has been located in the same block on Fourth street for over 50 years.

A PIONEER IN RUBBER MANUFACTURE.

Colbee Osmond Benton, an old-time rubber manufacturer, died late in December at his home in Framingham, Massachusetts, aged 81 years. Mr. Benton was born in Lebanon, New Hampshire, June 21, 1835, and at the age of 19 entered the employ of the Canadian Rubber Co., at the time of its establishment in Montreal, Canada, having gone there with Messrs. Brown, Bourn, Chaffee, and Nathaniel Hayward. Mr. Benton realized the growing importance of the rubber industry, and devoted much time and study to compounds and processes. In 1863 he went to Manchester, England, and became superintendent of the Weast Rubber Co., manufacturing mechanicals and footwear. He later established the manufacture of mechanical goods at the factory of the Liverpool Rubber Co.

At that time poor health necessitated his return to his home in New Hampshire, and after two years' rest he became connected with the Boston Car Spring Co. in Boston, Massachusetts. In 1876 he commenced manufacturing sun-cured rubber garment cloth for the Conant Brothers of Boston, at first in Cambridge, Massachusetts, and then in South Framingham, Massachusetts, where a factory was built in 1877. It is said that he was the first man to use African rubber successfully in the manufacture of mechanical goods. In 1885, because of impaired health, he again retired for a time, but the next year associated himself with the Saratoga Rubber Co., at Saratoga, New York, but his health failing, he was forced to retire permanently, and for sev-

eral years past had been an invalid. Mr. Benton was a prominent member of St. Andrew's Protestant Episcopal Church at Framingham. His wife survives him.

FIRST TRAFFIC MANAGER OF A RUBBER COMPANY.

Frederick Russell Lyman, traffic manager of The Fisk Rubber Co., Chicopee Falls, Massachusetts, died of pneumonia January 7, at the age of 47. He had been employed by the Fisk company for the past 17 years, coming to it when it was in its infancy. As the originator of its traffic department, he was widely known among railroad men from coast to coast, and was a member of the Traffic Club of New York and the Hampden County Traffic Association. Mr. Lyman is said to have been the first traffic manager of a rubber company in the United States. Besides his wife and mother, he leaves two daughters, a sister and two brothers.

LONG A RUBBER FOREMAN.

J. Franklin Bates, for many years a foreman in the American Rubber Co. plant at Cambridge, Massachusetts, died in that city January 5, aged 62 years. His wife survives him.

JUDICIAL DECISIONS.

PANTHER RUBBER MANUFACTURING CO. v. J. T. S. RUBBER CO. This cause in equity came up for a hearing upon a motion of the defendant to dismiss a petition of the complainant for a preliminary injunction to restrain it from manufacturing certain patented rubber heels. The defendant's ground for its motion was that claim No. 1 of the patent involved was not infringed by its (the defendant's) heel construction.

The complainant's patent was for "a rubber heel attachment for boot and shoe heels, consisting of a heel section or body molded to a concavo-convex form, and provided with a raised marginal portion and openings therethrough." It was held not infringed by rubber heels manufactured by defendant, which did not resemble in form those described in the complainant's patent. [The Federal Reporter, Vol. 334, page 377.]

MICHELIN TIRE CO. v. E. L. HEARN. Action by the Michelin Tire Co. against E. L. Hearn. Judgment for the defendant. Plaintiff appealed and decision affirmed.

This was a suit for an itemized account, based upon a contract covering a consignment of tires.

Hearn, being adjudged bankrupt, and granted a discharge in bankruptcy, claimed that this discharge included indebtedness on this account. Judgment was so entered. This decision on subsequent appeal was affirmed. [The Southwestern Reporter, Vol. 188, page 943.]

DE LASKI & THROPP CIRCULAR WOVEN TIRE CO. ET AL. v. UNITED STATES TIRE CO. This was an appeal from the District Court of the United States for the Southern District of New York, which decided for defendant in an equity suit by the De Laski & Thropp Circular Woven Tire Co., and the John E. Thropp's Sons Co. against the United States Tire Co. The Thropp patent No. 822,561, for an apparatus for manufacturing wheel tires, was held void for application by prior use. It was held, in this case, that the "date of invention" of a patented device is the date when the invention in its entirety, as patented, was conceived. The decree of the court below was affirmed. [The Federal Reporter, Vol. 235, pages 290 to 295.]

News of the American Rubber Trade.

REPUBLIC RUBBER CO.

AT the annual stockholders' meeting of the Republic Rubber Co., Youngstown, Ohio, held January 22, the following directors were elected: M. I. Arms, C. H. Booth, Robt. Bentley, R. E. Cornelius, H. M. Garlick, J. H. Kelly, L. T. Petersen, Thos. L. Robinson, John Tod, John C. Wick, C. F. Garrison.

The directors organized by electing Thos. L. Robinson, president and chairman of the board; L. T. Petersen, first vice-president; J. H. Kelly, second vice-president; M. I. Arms, 2nd, treasurer, and C. F. Garrison, secretary.

A dividend of 2 per cent was declared on the common stock, payable February 1, and $1\frac{3}{4}$ per cent on the preferred stock, payable March 1. The annual report showed an increase in the company's business for 1916 of more than 75 per cent over that of 1915.

**"EXCELLEREX"—A NEW
ORGANIC ACCELERATOR.**

Nearly all large rubber mills have their own "speeders" that are known by chemists as "catalysers." The composition and methods of use are carefully guarded; however, it is known that aniline oil has usually formed a part of these secret compounds.

While aniline oil gives excellent results there are many disadvantages in its use. For instance, the fumes are extremely poisonous and it is difficult to handle in regard to quantity, as such small proportions as ounces are used in the usual batch of 100 pounds or more. A certain amount of the free oil is lost by vaporizing from the hot mill. To overcome this, and without knowing how to compute this vaporizing loss, a compounder is apt to add a little too much with the result that the rubber does not age properly, and after a certain time loses its life and deteriorates much more quickly than a compound without the oil. It has advantages, however, as a toughener, as a standardizer in removing certain impurities from the rubber and bringing all grades in which it is used to a known uniformity.

"Excellerex" is a dry powder, the result of combining aniline oil with other chemicals and evaporating, drying and powdering.

It is claimed that this material possesses all the advantages of aniline oil without any of its disadvantages, and rubber in which it is used, has not shown the slightest tendency to deteriorate after two years' exposure.

It is really a vitalizing compound, absolutely pure and free of sulphur, that will not vulcanize rubber by itself, yet by using

it in quantities of $\frac{1}{2}$ to 2 per cent, based on the rubber content of the formula, it serves as an accelerator, cutting the cure greatly.

It has been claimed that one ounce of this accelerator will do the work of a pound of litharge; this, however, has not been positively verified.

A MOVEMENT TO IMPROVE SHIPPING FACILITIES.

The rubber industry, dependent as it is upon ships for its principal raw material, and also for export of an increasing amount of manufactured goods, will surely welcome the efforts of the National Marine League of the U. S. A. to encourage and facilitate the growth of an adequate merchant marine. A canvass of manufacturers and exporters is now in progress to ascertain to what extent American commerce is suffering from lack of tonnage. Rubber firms are invited to join in filing with the League at its headquarters, Old Slip, New York City, all known instances of difficulties in the shipment of goods or of cancellation of orders due to lack of shipping facilities, together with particulars and amounts involved. This information will be held confidential if so indicated, the purpose being to arrive at sums total.



THE RUBBER TREE OF THE INDIA RUBBER WORLD.

The rubber industry is analogous to the rubber tree upon which it depends for its existence. Its foundation is deeply rooted in the country's industry. Subterranean roots grope in all directions to supply nourishment to the parent body. The essential elements combine in the stem to give life and strength that the trunk and limbs may expand. The buds spring forth in response to healthy growth. New branches ramify, giving strength and protection to the structure. New leaves in symmetrical rows unfold to the sun. Flowers bloom, the fruit matures and pregnant seeds are scattered widely.

"MAGMETCO" BRAND 15/17 PER CENT AND FREE OF FREE SULPHUR.

"Magmetco" is the name of a new brand of crimson and golden antimony recently offered to the rubber trade. It is manufactured by the Magnolia Metal Co., New York City, maker of the well-known Magnolia babbit metal, and sold by the St. George Chemical Co., 99 John street, New York City. These brands are produced with 15-17 per cent free sulphur and also free of free sulphur.

TRADE NOTES.

The shop employes of the Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin, maker of electric controlling devices, received Christmas presents in cash from the firm, and all of the 2,400 employes received a bonus of 10 per cent of their yearly wages or salary as a New Year's gift.

F. Bierman & Sons, St. Louis, Missouri, have recently moved into their new warehouse, which is 100 by 100 feet, contains three floors and basement, and is equipped with a sprinkler system, electric elevator and other convenient arrangements for the handling of their large trade in waste rubber, etc.

The A. & A. Rubber Co., Framingham, Massachusetts, has reorganized as the Archer Strauss Rubber Co., with increased physical and financial strength to meet the growing demands of its business in proofed fabrics.

J. H. Lane & Co. have been appointed sole selling agents of the Exposition Cotton Mills, Atlanta, Georgia. The mills manufacture sheetings and drills with 60,000 ring spindles and 1,550 looms.

The Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut, recently completed a very comfortably furnished hotel for its employes which will accommodate about 80 people.

The unsecured creditors of the S. & L. Rubber Co., Chester, Pennsylvania, have been paid a dividend of .06077 per cent, in full settlement of their claims.

The Hochschild-Kelter Co., Chicago, Illinois, importer of druggists' sundries, has reorganized under the name of The Hochschild-Walker Corporation, only a few members of the old company remaining with the new corporation. This concern is the exclusive distributor in the Central West for Tyrian automobile tires and tubes.

The McKnight Sundries Co., Waco, Texas, importer and jobber of druggists' sundries and specialties, during 1916 increased its sales 61 per cent over the previous year, paying a 20 per cent cash dividend to stockholders.

The Imperial Rubber Co., New York City, has been voluntarily dissolved.

At a stockholders' meeting of The Simplex Rubber Co. of America, Inc., Ossining, New York, held December 29, for the purpose of passing upon a proposition for the sale of the assets, the reconstruction, consolidation or merger of the company with the Batavia Rubber Co., resolutions were adopted indicating the favorable attitude of the stockholders toward the affiliation of the two companies in question, and the details of further action were referred to the directors of the Simplex company.

H. F. Baker, of Hartford, Michigan, is seeking a patent on a substitute for hard rubber made from marl, a calcareous clay. This is subjected to a chemical process and is claimed to be an excellent substitute for hard rubber.

The I. T. S. Rubber Co., Elyria, Ohio, is adding several buildings to its plant. The company is a large producer of rubber heels.

The Manhattan Rubber Manufacturing Co., Passaic, New Jersey, announces the opening of offices at 318 Commerce Building, Erie, Pennsylvania, in charge of D. C. Ely.

The Vulcanite Manufacturing Co., Lindenhurst, New York, has increased its capital stock from \$100,000 to \$200,000, and is preparing to add to its plant.

Charles T. Wilson Co., Inc., New York City, has removed its offices from 46 Cortlandt street to 56 Wall street.

H. T. West Co., Inc., Boston, Massachusetts, dealer in chemicals, has removed from 40 Central street to temporary quarters at 113 State street, and on April 1 will be permanently located in the new Fidelity Building at 150 State street.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest, not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

[265.] A publication dealing with cost accounting as applied to tire manufacture is sought.

[266.] A correspondent wishes to know where machinery for coagulating and washing plantation rubber may be purchased.

[267.] We have received an inquiry for soft rubber disks about $\frac{5}{8}$ inch in diameter by $\frac{3}{16}$ inch thick.

[268.] A machine which will separate rubber from canvas is sought.

[269.] A foreign subscriber seeks information concerning American manufacturers or importers of accelerators for the vulcanization of rubber.

[270.] A correspondent wishes to know where he can obtain organic accelerators, including hexamethyl-tetramine and thiocarbamide.

[271.] Names of manufacturers of toy rubber balls, dolls and animals are requested.

[272.] Names of firms who build or lease tire-building machines have been requested.

[273.] A correspondent wishes to be advised of manufacturers of machinery required for the weaving of cotton fire hose fabrics.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Samples and prices of rubber heels are desired by a man in Spain. Report No. 23,391.

A merchant in Spain desires to purchase rubber sponges. Report No. 23,393.

A shoe factory in Switzerland desires to purchase 10,000 rubber heels in various sizes and qualities. Report No. 23,409.

A merchant in Spain wishes to secure an agency for the sale of rubber goods, especially automobile tops and inner tubes. Report No. 23,410.

A firm in Switzerland wishes to purchase red and black, hard, vulcanized fiber for the manufacture of pocket knives and cutlery. Report No. 23,505.

Representation of American manufacturers and exporters of pneumatic tires and rubber sponges is desired by a man in Spain. Report No. 23,518.

An agency for the sale of rubber goods is desired by a man in Argentina. Report No. 23,480.

WESTINGHOUSE WELFARE WORK.

The Westinghouse Club, at the plant of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, is a remarkable institution. Organized in 1902 primarily for the benefit of technically trained students, this class predominates, although membership in the club is now open to any factory employee. The present membership, recruited from all of the Westinghouse companies in the Pittsburgh district, is now about 850.

The club is operated by a board of directors, three of whom are appointed by the company and three elected by the members, and a paid manager and assistant manager are employed to devote their entire time to the club. Specially appointed committees handle the varied activities, one of the most important being regular classes for the systematic study of the theory, design and application of the Westinghouse apparatus. The 65 by 140-foot gymnasium affords exceptional facilities for athletics; there is a valuable library, and entertainments and lectures bring the members together and increase their happiness and efficiency.

GUTTA PERCHA & RUBBER, LIMITED, CHANGES.

W. G. Fowler has been made manager of the Pacific division of Gutta Percha & Rubber, Limited, Toronto, Canada, and will have his headquarters in Vancouver, British Columbia. Mr. Fowler has been with the company for about 25 years, acting as manager of the Alberta division, with headquarters at Calgary, ever since that branch was opened.

W. R. Wayman has been appointed manager of the Calgary branch.

H. R. Hamilton, formerly manager of the Eastern division, with headquarters at Montreal, has been transferred to the head office at Toronto and appointed assistant manager of the shoe department. R. B. Reid succeeds Mr. Hamilton as manager of the Eastern division.

H. D. McWhirter, former manager of the Central division, with headquarters at Winnipeg, has been appointed manager of both the Central and Alberta divisions, and C. N. Larsen, assistant manager of these divisions.

George Tait, who has completed 25 years of service with the company and who, for many years past, has been manager of the fire hose department, recently celebrated his seventy-third birthday. Mr. Tait has now retired from business on pension.

STUNGO-RADIUM RUBBER CO. BUYS PLANT.

The Stungo-Radium Rubber Co. has purchased a plant at Washington, Pennsylvania, which affords a practically new factory building, 500 feet long and 125 feet wide, with the entire ground floor of steel and concrete construction, and a separate power house, equipped with two 300-horsepower Erie boilers with patent stokers and Sturtevant blowing system for pure air and proper ventilation.

The company will manufacture rubber goods of all kinds, but will specialize in pneumatic automobile tires and solid and cushion truck tires. United States patents have been acquired for the Stungo Special Automobile Tires constructed upon a secret system for which exceptional merits are claimed.

Joseph Stungo, widely known in England and Scotland as a tire expert and technical engineer, will have direct supervision of the entire mill. Employment will be given to 500 mechanics.

BRUNSWICK COMPANY BUILDS WORKMEN'S HOMES.

The large factory of the Brunswick-Balke Collender Co., at Muskegon, Michigan, is rapidly nearing completion and will bring a thousand new workmen from all parts of the country, increasing Muskegon's population by about 4 per cent. The Brunswick company is planning houses for its workmen and to provide for immediate necessities 48 double houses, each of a different pattern, are now being built. Each separate unit will have a large porch, six rooms and a bathroom, and the homes will be sold to the workmen at actual cost, on the easiest terms.

THE NATIONAL RUBBER CO.

James A. Murray is to become president and general manager of the National Rubber Co., Pottstown, Pennsylvania, having resigned his office as vice-president and general manager of the Seamless Rubber Co., New Haven, Connecticut. Mr. Murray will locate in Pottstown permanently in March. In his new position he succeeds Jacob G. Feist, who at the reorganization of the board of directors in February will be named as treasurer.

This change is necessitated by the rapid growth of the National company and is intended to relieve Mr. Feist and allow him more time for outside management. Operations have already begun in the new concrete building of the company and a business of approximately \$4,000,000 is anticipated during the year 1917. There will be no changes in the working force, William C. Walsh being retained as superintendent.

CRUDE RUBBER BROKER EXTENDS ACTIVITIES.

Charles E. Wood, crude rubber broker, with headquarters at 24 Stone street, New York City, has recently had occasion to increase his office space, not only in New York, but in the Hamilton building, Akron, Ohio, as well.

He has also augmented his staff at both points, the new acquisition on the New York end being Drew McKenna, for 15 years



D. McKenna.



W. M. Korhammer, Jr.

connected with The B. F. Goodrich Co. Mr. Wood feels that this addition to his organization will not only promote the development of an already progressive enterprise, but will enable him to increase the efficiency of his service to his clients.

The new member of the Akron staff is W. M. Korhammer, Jr., who for a number of years has been in the electrical business, and has severed his connections with the Western Electric Co., of New York City, to accept the position with Charles E. Wood.

PERSONAL MENTION.

J. A. McKenzie, manager of the Victoria, B. C., branch of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, recently returned from a six months' trip in Australia and New Zealand.

At a meeting of the Rhode Island Shoe Retailers' Association in Providence, Rhode Island, early last month, E. B. Pearson, manager of sales of the Converse Rubber Shoe Co., Malden, Massachusetts, was the speaker, of the evening, discussing the cost of rubbers and the reasons for the advance in prices.

A. J. Pennington is in charge of the tire plant of The Brunswick-Balke-Collender Co., Muskegon, Michigan, and M. J. Whalen is in charge of the hard rubber department.

J. R. Gemmill is now in charge of the Chicago, Illinois, branch of the Pennsylvania Rubber Co., Jeannette, Pennsylvania.

E. W. Openshaw, for several years connected with the molded goods department of The B. F. Goodrich Co., New York City, is now with the Hewitt Rubber Co., Buffalo, New York.

M. B. Clarke has resigned as superintendent of the druggists' sundries department of the Gordon Tire & Rubber Co., Canton, Ohio, and the duties of C. W. McKone, superintendent of the tire and tube department have been extended to include the druggists' sundries department.

E. M. Waldo, of the firm of E. M. & F. Waldo, colors for rubber compounding, New York City, is in England for several weeks arranging for supplies of certain products sold by his firm.

NEW INCORPORATIONS.

Advance Rubber Co., January 16 (Delaware), \$2,000,000. F. D. Buck, George W. Dillman, and M. L. Harty—all of Wilmington, Delaware. Principal office, Delaware Charter Guarantee & Trust Co., 328 DuPont Building, Wilmington, Delaware. To deal in tires, tubes and automobile accessories, etc.

Akron Biltwell Tire & Rubber Co., The, December 27 (Ohio), \$200,000; M. Braley, J. F. Risch, W. H. Kline and W. A. Young. Principal office, Akron, Ohio. To manufacture tires and accessories.

Archer-Strauss Rubber Co., January 4 (Massachusetts), \$100,000. Aaron L. Strauss, 16 Browne street, and Albert Gutterman, 77 Browne street, both in Brookline, Massachusetts, and Calvert B. Archer, 45 Irving place, Framingham, Massachusetts. Principal office, Framingham, Massachusetts. To manufacture and deal in rubber and rubber products.

Automatic Top Sales Corporation, The, January 6 (New York), \$500,000. Donn Wood, Thomas H. Smith, and Baylis M. Dawson—all of 10 Wall street, New York City. Auto top business.

Auto Tire Exchange, Inc., January 12 (New Jersey), \$100,000. Herman Lefkowitz, 127 Johnson avenue; Leo Kaplus, 129 Johnson avenue; Morris E. Rothhouse, 173 Morris avenue—all of Newark, New Jersey. Principal office, 225 Halsey street, Newark, New Jersey. To manufacture and deal in tires, tubes, etc.

Balanced Whip Golf Club Co., Inc., December 1 (New York), \$15,000. Rufus P. Johnston, president and treasurer; P. H. Lynch, vice-president; George N. Vanderbilt, secretary. Principal office, 103 Park avenue, New York City. To manufacture the Balanced Whip Golf Club.

Brooklyn Rubber Works, Inc., January 16 (New York), \$5,000. Axel Larson, 168 East 112th street, New York City; Frederick S. Lafond, Jr., 1117 Carroll street, and Theodore A. Deveer, 28 Boerum place—both in Brooklyn, New York. Tires, etc.

Great Republic Tire & Rubber Manufacturing Co., January 15 (Delaware), \$100,000. W. H. Owens, Denton, Texas; K. M. Dougherty and E. Lynch—both of Wilmington, Delaware. Principal office, Colonial Charter Co., 927 Market street, Wilmington, Delaware. To manufacture and deal in automobile tires, inner tubes and other rubber products.

Hagberg Automobile Co., January 5 (Kansas), \$150,000. C. A. Hagberg (president and general manager), F. L. Fraser (secretary and treasurer)—both of Wichita, Kansas, and R. E. Newberry (vice-president and sales manager). Principal office, Wichita, Kansas. To manufacture and deal in rubber goods, automobile supplies, accessories, etc.

Henry's Tire Shop, December 5 (Oregon), \$5,000. John T. Henry, John Henry and R. H. Cochrane—all of 82½ North Broadway, Portland, Oregon. Principal office, Portland, Oregon. To deal in tires, etc.

Independent Tire Co., December 27 (Tennessee), \$6,000. F. F. Cain, M. E. Cain and A. B. Hatch. Principal office, Memphis, Tennessee. To deal in auto tires and accessories.

Manufacturers Tire & Rubber Co., Inc., January 9 (New Jersey), Eric Windmiller, 43 High street, Passaic; Herman Feder, 335 Belmont avenue, Newark, both in New Jersey, and Justin S. Galland, 25 Broad street, New York City. Principal office, 335 Belmont avenue, Newark, New Jersey. To manufacture machinery, tires, rubber goods, etc.

National Compo. Co., Inc., December 26 (New York), \$5,000. Jacob Meisel, 752 Broadway; Paul R. Gordon, 149 Broadway, both in New York City, and Abraham Litzky, Newark, New Jersey. Insulating materials, etc.

North Star Rubber Co., October 20 (Minnesota), \$50,000. Jeremiah C. Spillane, J. W. Laramy and Samuel H. Greeley, all of St. Paul, Minnesota. Principal office, St. Paul, Minnesota. To manufacture rubber products.

Olsen, Wilson & Stendicke, Inc., January 4 (New York), \$15,-

000. Albert Olsen, 427 East 158th street. William J. Wilson, 511 West 143rd street, and Richard A. Stendicke, 173 East Seventy-fourth street, all in New York City. To deal in auto tires, tubes, etc.

Peerless Tire & Rubber Co., January 5 (Wisconsin), \$50,000. F. E. Burrall, John P. Jessen and A. W. Brown, all of Green Bay, Wisconsin. Principal office Green Bay, Wisconsin. To manufacture and deal in tires, rubber goods, etc.

Samson Tire & Rubber Corporation, January 12 (Delaware), \$1,000,000. James M. Satterfield, L. B. Phillips and J. B. Bailey, all of Dover, Delaware. Principal office, United States Corporation Co., 311 South State street, Dover, Delaware. To deal in tires, etc.

Security Tire & Rubber Co., December 27 (Delaware), \$1,000,000. V. C. Bogardus, H. H. Waller and M. Friedberg, all of 140 Nassau street, Manhattan Borough, New York City. Principal office, Capital Trust Co., of Delaware, Dover, Delaware. To manufacture and sell inner tubes for automobile tires.

Stearns Tire & Tube Co., Inc., December 26 (New York), \$250,000. A. K. Ott, 518 West 161st street, New York City; Henry Pearlman, 2038 Eighty-fifth street, and M. Hawthorne, 1221 Fifty-fourth street, both in Brooklyn, N. Y. To manufacture tires, tubes, etc.

Tire Co. of America, December 12 (Wisconsin), \$2,000. Edward Ver Halen, John Gregory, and E. H. Ludwig. Principal office, Milwaukee, Wisconsin. To manufacture and deal in tires, etc.

Titan Tire & Rubber Co., Inc., January 17 (New York), \$1,200,000. Horace D. Newman, 329 West Forty-eighth street; John J. Gray, 309 East Seventeenth street, both in New York City, and J. Gerald Kenlon, Goytesville, New Jersey. Principal office, Batavia, New York. To manufacture rubber goods.

Utica Tire Exchange Co., Inc., January 13 (New York), \$5,000. Alonzo Hand, Vernon; N. F. Hand and Earl G. Becker, 49 Franklin Square, Utica, both in New York. Principal office, Utica, New York. To deal in tires.

Washington Waterproof Clothing Co., Inc., January 8 (New York), \$10,000. Benjamin Jacobson and L. Jacobson, 1338 Forty-fifth street, Brooklyn, New York, and Hyman Cohen, 611 West 113th street, New York City. To manufacture rubberized clothing, etc.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on January 24 are furnished by John Burnham & Co., 115 Broadway, New York City, and 41 South La Salle Street, Chicago, Illinois:

	Bid.	Asked.
Ajax Rubber Co. (new).....	76	77½
Firestone Tire & Rubber Co., common.....	140	145
Firestone Tire & Rubber Co., preferred.....	140	108½
The B. F. Goodrich Co., common.....	59½	60½
The B. F. Goodrich Co., preferred.....	111	112
Goodyear Tire & Rubber Co., common.....	278	282½
Goodyear Tire & Rubber Co., preferred.....	107½	108½
Kelly-Springfield Tire Co., common.....	59¾	60
Kelly-Springfield Tire Co., 1st preferred.....	92¾	95
Miller Rubber Co., common.....	248	255
Miller Rubber Co., preferred.....	107½	108½
Portage Rubber Co., common.....	164	166
Portage Goods Manufacturing Co., preferred.....	110	..
Swinehart Tire & Rubber Co.....	84	87
United States Rubber Co., common.....	59¾	60¼
United States Rubber Co., preferred.....	110	111

RUBBER COMPANY DIVIDENDS.

The Besaw Tire & Rubber Co. paid a dividend of 7 per cent on all preferred stock from date of issue to January 1, to stockholders of record on that date.

The board of directors of the United States Rubber Co. has declared a quarterly dividend of 2 per cent on the first preferred stock and a quarterly dividend of 1½ per cent on the second preferred stock, payable January 31 to stockholders of record January 15.

The Kelly-Springfield Tire Co. has declared a quarterly dividend of 4 per cent on the common stock, payable February 1 to stockholders of record January 15.

PERSONAL MENTION.

John Clinton, formerly connected with the Boston, Massachusetts, office of the Firestone Tire & Rubber Co., Akron, Ohio, has been given charge of the company's branch at Buffalo, New York.

G. K. Meeks has been placed in charge of the Wichita, Kansas, branch of the Firestone Tire & Rubber Co., Akron, Ohio.

J. C. Withers succeeds W. I. Fornof as manager of the Nashville, Tennessee, depot of The B. F. Goodrich Co., Akron, Ohio.

John L. Butler has been appointed advertising manager of the Pennsylvania Rubber Co., Jeannette, Pennsylvania.

John B. Maus, export manager of The Fisk Rubber Co., Chicopee Falls, Massachusetts, recently returned from a trip through Porto Rico during which he made a close study of conditions there. He finds motoring on the increase, with American cars used exclusively. City streets are narrow but country roads excellent, although hard on tires.

Jesse E. LaDow, of the Mansfield Tire & Rubber Co., Mansfield, Ohio, has been deeply impressed by the exceptional economic and industrial conditions in Japan. Further observation of the growing rubber industry there, its manifest advantages of cheap labor, excellent shipping facilities and proximity to the source of crude rubber, has again led him to write interestingly to several American newspapers, this time from Osaka, advocating an American import tax on all foreign manufactured rubber goods based for each country upon the difference between the cost of labor there and in the United States, plus the increased cost of crude rubber here. This he believes would effectually protect both capital and labor in America.

During the past month, Henry S. Marlor, general superintendent of the Goodyear Tire & Rubber Co., at Williamsport, Pennsylvania, married Miss Mildred Sutton Ward, daughter of Mr. and Mrs. James Henry Ward and great-granddaughter of Cornelius Vanderbilt.

C. A. Jessup has succeeded P. G. Frazier as manager of the St. Louis, Missouri, branch of the Kelly-Springfield Tire Co.

Richard H. Newell, for the past six years connected with The Fisk Rubber Co., Chicopee Falls, Massachusetts, as chemist, is now superintendent of the Dreadnaught Tire & Rubber Co., Baltimore, Maryland.

George M. Martin is in charge of the new branch of the Kelly-Springfield Tire Co., at Minneapolis, Minnesota.

George C. Van Veen has been appointed manager of the newly opened branch of The Mason Tire & Rubber Co., Kent, Ohio, at 1732 Grand avenue, Kansas City, Missouri.

FIRESTONE PROMOTIONS.

Dan C. Swander, formerly eastern district manager of the Firestone Tire & Rubber Co., Akron, Ohio, and one of the company's most energetic workers, has been appointed manager of the Boston branch. L. G. Fairbank has succeeded him as eastern district manager.

C. E. Speaks, formerly manager of the cycle tire department, has been made manager of truck tire sales, being succeeded in the cycle tire department by Henry E. Haws, formerly assistant manager.

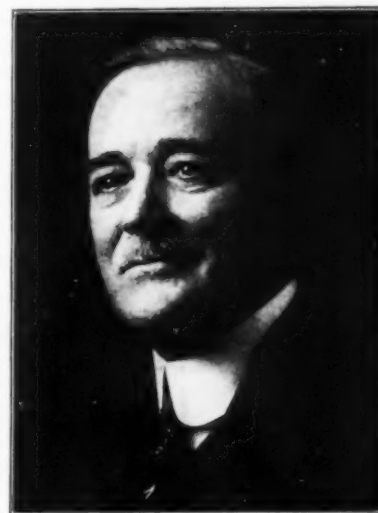
W. J. Slater, formerly manager of the sales promotion department, is now special representative of the general sales department, Sherman L. Lewis succeeding him as sales promotion manager.

Salesmen recently promoted to branch managerships are: M. M. Whorley, Syracuse, New York; G. K. Meeks, Wichita,

Kansas; Milton Van Keuren, Albany, New York; A. C. Searle, Minneapolis, Minnesota; H. C. Buchanan, Charlotte, North Carolina.

NEW FISK APPOINTMENTS.

Fred H. Ayers has been placed in charge of the sales organization of The Fisk Rubber Co., with headquarters at the general offices at Chicopee Falls, Massachusetts.



F. H. AYERS.

Mr. Ayers is well known in Eastern tire circles, having been with the Fisk company since 1905. In 1909 he became manager of the Boston, Massachusetts, branch, and when the sales organization was divided into districts five years later, he was given supervision of all the company's branches in New England and New York State, east of Buffalo, last July becoming supervisor of districts. George T. Newton succeeds Mr. Ayers.

W. H. Barcus, for two years in charge of the Fisk branch at Cleveland, Ohio, has been appointed manager of the newly created Cleveland district, which embraces the company's branches at Cleveland, Toledo, Lima, Columbus, Youngstown, Dayton, Cincinnati and Pittsburgh.

E. J. McMartin, formerly branch manager at Butte, Montana, will have charge of the district about to be created, which includes the branches at Butte, Great Falls, Billings, Salt Lake, Rapid City, Minot and Bismarck.

Roy L. Sergeant, for the past two years in charge of The Fisk Rubber Co.'s interests in the southern end of California, has been placed in charge of the company's business for the entire Pacific Coast territory, with headquarters in San Francisco.

GOODYEAR CHANGES.

F. F. Tilden has been appointed manager of the branch of the Goodyear Tire & Rubber Co. at Columbus, Ohio, succeeding W. W. Magill.

W. S. Boone, formerly branch manager at the Scranton, Pennsylvania, branch, has been made supervisor of city sales at Philadelphia, Pennsylvania.

W. G. Starnes has been elected manager of the Atlanta, Georgia, branch, succeeding J. E. Taylor, who has been transferred to the Dealers' Help division of the automobile tire department at Akron, Ohio.

F. W. Nason, formerly Goodyear manager at Rochester, New York, has been transferred to the export department at Akron, Ohio.

F. N. Hammond, recently branch manager at Youngstown, Ohio, has been made branch manager at Cleveland, Ohio, succeeding R. S. Hartzell, who has been placed in charge of manufacturers' business in Cleveland and vicinity, under the jurisdiction of the Detroit, Michigan, district office. Mr. Hartzell's headquarters will continue at Cleveland.

TRADE NOTES.

Some time ago the receivers of the Dreadnaught Tire & Rubber Co., Baltimore, Maryland, brought suit against certain stockholders who had subscribed for stock and then failed to pay, these unpaid subscriptions being listed among the assets of the bankrupt company. The United States Court in Baltimore has now given judgment against the subscribers, and sums varying from \$42 to \$207 will have to be paid by 16 men, the only ones out of a total of 108 who failed to settle with the receivers after being sued, without waiting for the case to be tried.

In addition to the companies mentioned last month, the McGraw Tire & Rubber Co., East Palestine, Ohio, and the Kelly-Springfield Tire Co., Akron, Ohio, have filed complaints with the Interstate Commerce Commission on freight classifications for rubber tires on the Southern railroad lines.

The New Tread Tire Co., Louisville, Kentucky, has changed its name to International Rubber Sales Co. This company acts as distributor for the International Rubber Half-Sole tires in the State of Kentucky, southern Indiana and southern Illinois, and is establishing agencies throughout this territory.

A grand prize diploma has recently been awarded the Hendrie Rubber Co., of Torrance, California, by the international exposition judges at San Diego, California. This is the more remarkable in that the company started making tires only four years ago.

The Kelly-Springfield Tire Co., New York City, has been awarded damages to the amount of \$376,000 for infringement of the Grant patent on solid rubber tires, the internal wire carriage tire used on the lighter horse-drawn vehicles. The defendants were The B. F. Goodrich Co. and the Republic Rubber Co.

The Globe Tire Co., capitalized at \$1,000,000, will locate at Laporte, Indiana, occupying the old H. B. Glover plant. The company will make pneumatic tires.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, has acquired several acres of land in the vicinity of the factory for the purpose of expanding its plant. It is reported that the company recently closed an order for \$1,000,000 worth of tires. The present officers are J. A. MacMillan, president; J. C. Hooven, vice-president, and C. E. Hooven, secretary and treasurer.

The General Tire & Rubber Co., Akron, Ohio, recently opened a branch at 1120 Michigan avenue, Chicago, Illinois. This is in charge of C. B. Adair. "General" tires are in active request and the company's daily output will shortly be increased to 800 tires. This company is also one of the most important producers of automobile accessories.

The Kelly-Field Co., New York City, formerly sales agent for the Lee Tire & Rubber Co., Conshohocken, Pennsylvania, has been purchased by the latter company from its owner, Harry Field. Mr. Field, whose exceptional ability is well known, will be retained in even closer connection with the Lee company, being placed in general charge of sales as head of the department that is to be organized to take the place of the Kelly-Field organization.

The Scanlon Auto Supply Co., Rochester, New York, now acts as exclusive distributor of the Amazon anti-blowout tire for the Amazon Tire & Rubber Co., Akron, Ohio, in the territory of Rochester and five surrounding counties.

Willard C. Campbell, Isaac C. Ames and Francis C. McCarty have been licensed as commissioners to open books of subscription to the capital stock of The Ames Tire Co. of Illinois, a proposed corporation whose organization has not been completed. This company will have a capitalization of \$10,000, consisting of 100 shares of the par value of \$100 each.

At the recent annual meeting of the Ten Broeck Tyre Co., Louisville, Kentucky, directors were elected as follows: H. L. Lewman, Fred Haupt, W. C. Lewman and F. E. Trumper. The board of directors elected the following officers: H. L. Lewman,

president; Fred Haupt, vice-president; W. N. Cox, treasurer, and W. C. Lewman, secretary and general manager. The report showed that the company had doubled its business in 1916, and considerable improvements and extensions were authorized.

The Zee-Zee Rubber Co., Yardville, New Jersey, has increased its capital stock from \$400,000 to \$1,000,000 to care for the increased demand for Zee-Zee tires and tubes. The latest addition to the mill of this company is practically completed and new machinery will shortly be installed, greatly adding to production capacity.

CLEVELAND ENGINEERS PLAN MANY RUBBER MILLS.

W. C. Owen & Co., engineers, 1900 Euclid avenue, Cleveland, Ohio, announce building operations for the following rubber companies:

Plans and specifications have been completed for a new rubber factory for the A. L. A. Tire Co., Detroit, Michigan, which will have a capacity of 400 tires per day. J. J. O'Shea, president, is now receiving bids for the construction of the building, which will be of reinforced concrete, fireproof, and completely equipped.

Plans are being prepared for The Boone Tire & Rubber Co., Sycamore, Illinois, to remodel the old plant of the Sycamore Tire Co. An addition will also be made to the present building, allowing for an immediate capacity of 300 tires per day and a future capacity of 600 tires per day. Bids are now being received on the equipment.

Complete equipment will be installed for a 500-tire plant for the International India Rubber Co., South Bend, Indiana, of which George W. Odell is general manager.

The new 300-tire plant of the Pearce Tire & Rubber Co., Ashtabula, Ohio, is practically finished, and the Owen company, which designed this building completely, is in the market for equipment.

The general contract for the first unit of the new plant of The East Palestine Rubber Co. has been awarded to Walker & Curley, Pittsburgh, Pennsylvania. The building will be 60 by 450 feet, of brick and steel construction, and the entire plant, when completed, will have a capacity of 300 tires per day. The officers of this company are: Everett Lyon, president; Abram Hartley, secretary, and B. C. Tunison, treasurer.

WHAT SIX TIRE SIZES HAVE DONE.

Although about 50 stock size tires are now manufactured, an interesting canvass recently made by the J. & D. Tire & Rubber Co., Charlotte, North Carolina, shows that only six sizes supplied 94 per cent of all cars built during the year 1916. These were 30 by 3, 30 by 3½, 32 by 3½, 33 by 4, 34 by 4 and 36 by 4½. This indicates that the S. A. E. leadership toward a standardized list of nine regular sizes, and an equal number of oversizes, was a move in the right direction. It also indicates that automobile manufacturers have caught the spirit of standardization to such a degree as for the moment to have wrested the leadership from their engineers, in this particular matter at least. The following table, showing the percentage of use of the 15 sizes most commonly employed during the past year, is of genuine interest:

Size.	Per Cent.
3 by 28	1.80
3 by 30	24.12
3½ by 30	29.15
3½ by 32	7.90
4 by 32	.25
4 by 33	10.10
4 by 34	20.01
4 by 36	.15
4½ by 34	1.55
4½ by 35	.44
4½ by 36	3.34
4½ by 37	.037
5 by 36	.075
5 by 37	.959
5 by 38	.007
	99.951

THE TIRE PRICE ADVANCE.

AS anticipated in the previous issue of THE INDIA RUBBER WORLD, the prevailing prices of tires and tubes with few exceptions were advanced from 2 to 20 per cent on January 1. As already explained in these columns, this was the inevitable result of the ever-increasing cost of labor, of compounding ingredients, and latterly of crude rubber itself. The table below gives the approximate percentages of the price advance of six leading firms for the several types of tires:

Ford Sizes.		Pneumatic.		Motor Cycle.		Bicycle Tires.		Solid or Truck.	
Casings	Tubes	Casings	Tubes	Casings	Tubes	Casings	Tubes		
10	5	15	10	15	10	0	0	10-12½	Firestone
15	0	15	0	10	10	0	0	10-12½	Fisk
5-20	10	5-20	10	10	10	0	0	10-12½	Goodrich
15	10	15	10	15	10	15	10	10	Goodyear
7½	0	12-12½	0	15	10	0	0	10	Kelly-S.
11-15	2-10	11-15	2-10	15	10	0	0	10	U. S.

THE PEARCE TIRE & RUBBER CO.

Favorable progress is being made at the plant of this firm in Ashtabula, Ohio, and it is expected that the factory will be finished and machinery installed by April 1. The location is at the foot of Benefit street, where the company has purchased 4¾ acres, about 1,000 feet of which adjoins the New York Central Railroad tracks. The two-story building will be of fire-proof, reinforced concrete construction, faced with brick, and will have 24,000 square feet of floor space. Individual Westinghouse motors will be used to generate power, and automobile tires and tubes in all sizes will be manufactured.



PLANT OF PEARCE TIRE & RUBBER CO.

At a recent meeting of the board of directors A. E. Pearce was elected president, J. L. Smith having resigned, and H. J. Atwood was made secretary-treasurer, in place of P. C. Remick, resigned. The present directors are A. E. Pearce, H. J. Atwood, F. L. Kerr and J. L. Smith, one vacancy being left on the board to be filled at a special stockholders' meeting on March 1 by an experienced Akron, Ohio, rubber man whose name will be announced at that time.

ASHTON W. CANEY ORGANIZES NEW RUBBER COMPANY.

The Titan Tire & Rubber Co., Inc., Batavia, New York, notice of whose incorporation appears elsewhere in this issue, was formed through the efforts of Ashton W. Caney, whose prominent connections with the Batavia Rubber Co. and the Sweet Tire & Rubber Co., of Batavia, have been previously recorded in THE INDIA RUBBER WORLD. The Titan company will make tires and rubber goods and do a general mercantile and contracting business. The present organization is temporary in character, and mention of the definitely formulated plans of this new concern will appear later.

Of value for daily reference in every rubber office.—"The Polyglot Rubber Trade Directory, 1916."

THE MILEAGE OF THE 1917 TIRE PRODUCTION.

Arithmeticians, whose chief delight is to play with figures, may find a few minutes' enjoyment in checking up those that follow, which emphasize anew the tremendous proportions attained by the principal department of the rubber industry in the United States. Assuming that the American tire production for 1917 will be 20,000,000 as predicted in THE INDIA RUBBER WORLD of December 1, 1916, and considering 5,000 as the average mileage for each tire, the staggering total mileage necessary to wear out the year's output would be 100,000,000,000. A car would have to cover 25,000,000,000 miles in order to wear them out, a distance equivalent to 1,000,000 times the distance around the world, or over 269 times the distance from the earth to the sun. In other words, they would replace the tire wear of an automobile going at the rate of 50 miles an hour day and night for a period of 57,077 years.

MAKING TIRES ON BROADWAY.

In order to show the public exactly what is meant by the term "cord tire," The B. F. Goodrich Co., during the New York automobile show, brought on and set up in the display windows of its building at 1780 Broadway two complete machines used in the Akron, Ohio, factory for the construction of Silvertown Cord tires. Perhaps the nearest thing to human dexterity known to mechanics, they accomplish what no human hand could in maintaining an absolutely equal tension on the cord as it passes back and forth across the surface of the form, making the tire of uniform strength at all points. Workmen, clad in white, operated the machines slowly enough so that the spectator could see how each layer of rubber-impregnated cord is applied and follow the motions of the human-like system of arms and hands which complete their several functions with such mechanical regularity and precision. As a convincing advertisement this instructive window display was a complete success.

PREVENTING TIRE THEFTS.

Year by year the "fully equipped" automobile includes more devices for the comfort, safety and assurance of motorists. Automobiling has become so general that tires are almost as good as ready money; tire thefts have therefore increased greatly and have given accessory manufacturers another subject for the application of their utmost ingenuity. But this year marks the entrance of some form of protection against tire theft as a frequent part of the regular motor car equipment. Perhaps the cleverest of the several schemes seen at the New York automobile show is that by which an extra wire wheel with tire attached is securely locked to the rear deck by means of a stud through the wheel flange. No straps or chains are required in connection with this locking device.

GOODYEAR TO MAKE OWN FABRIC.

The Goodyear Tire & Rubber Co., Akron, Ohio, which has taken a large proportion of the output of the Killingly Manufacturing Co., of Killingly, Connecticut, has now secured control of that manufacturing plant. A new company has been incorporated with \$5,000,000 under the name of the Goodyear Cotton Mills, the incorporators being Francis Seiberling, Fred Miller and Harold Hutchins. The plant is a large one with steam and water power, and its present equipment of 17,500 ring and 1,200 twisting spindles, and 60 broad looms will be further increased. It is reported that the new company has decided to erect a large yarn mill and 100 tenement houses in Williamsville, Connecticut, in the immediate future, this mill to have a capacity of 100,000 pounds of tire yarn per week.

THE UNITED STATES RUBBER COMPANY'S RE-FINANCING PLAN.

THE refinancing of the United States Rubber Co. by the issue of \$60,000,000 bonds, which, it is expected, will be authorized by the stockholders at a meeting on the fourteenth of this month, is a move of more than ordinary interest in both rubber and financial circles.

These 5 per cent bonds maturing January 1, 1917 are to be secured upon the properties owned or controlled by the company by direct mortgage thereupon or by pledge of mortgage bonds of the companies owning or controlling the same, or by pledge under the mortgage of the United States Rubber Co., or under the mortgages securing the mortgage bonds so pledged, of shares of stock of the companies owning or controlling the same with a covenant not to permit mortgages thereupon. It is understood that the purpose is to provide for the payment of all maturing obligations of this great corporation with certain minor exceptions. It is intended that all existing bonds and liens upon the properties of the company or its subsidiaries will be paid on or before December 1, 1918, the exceptions being \$2,600,000 gold bonds of the Canadian Consolidated Rubber Co. maturing in 1946 and \$9,000,000 debentures of the General Rubber Co. due December 1, 1918. The latter will be left undisturbed for the present, as the company announces it has under consideration other plans for dealing with its important crude rubber interests. Of the \$60,000,000 bonds to be issued forthwith, \$24,697,148.07 is to be set aside to retire the following:

United States Rubber 6 per cent bonds due December 1, 1918.....	\$16,000,000.00
Eureka Fire Hose Manufacturing Co. 5 per cent bonds due December 1, 1918.....	970,000.00
Canadian Consolidated Rubber Co., Limited, 5 per cent debentures due December 1, 1918.....	2,500,000.00
Morgan & Wright 5 per cent debentures due December 1, 1918.....	5,000,000.00
Mechanical Rubber Co. 6 per cent first mortgage bonds due January 1, 1918, \$687,000.00	
Less sinking fund deposited with trustee	459,851.93
	227,148.07
	<u>\$24,697,148.07</u>

The remaining bonds presently to be issued are to provide for the funding of current indebtedness, for additional working capital, for discounts and premiums in connection with the above refunding and for other corporate purposes. Another \$10,000,000 of the bonds may be issued for working capital, and for development, and for other purposes, and out of the remaining bonds reservation is to be made to provide for the \$9,000,000 General Rubber Co. 5 per cent debentures due December 1, 1918, until otherwise provided for, and the \$2,600,000 Canadian Consolidated Co. bonds, due October 1, 1946. Any additional bonds, and any bonds not used for such refunding are to be reserved for capital expenditures made after January 1, 1917, for additions, betterment, improvements, or for new properties, at 75 per cent of cost.

The circular sent out by President Samuel P. Colt states that the net earnings of the company and its subsidiary companies available for interest during these years, as found by Messrs. Haskins & Sells, have been:

For the fiscal year ending December 31, 1914.....	\$10,690,988.48
For the fiscal year ending December 31, 1915.....	11,539,313.10
For the fiscal year ending December 31, 1916 (partly estimated)	12,500,000.00

The above net earnings are after deducting expenses of every nature, except interest, and including expenditures for repairs and renewals through which the plants are maintained in the

highest state of efficiency. The average losses from bad debts during these years have been less than $\frac{1}{2}$ of 1 per cent of the total sales.

Further, the circular states that the consolidated financial position of the company, and its subsidiary companies, as of October 31, 1916, but after applying the proceeds of the sale of these \$60,000,000 new bonds, is appraised as follows:

Property, plant and equipment.....	\$54,850,204.33
Manufactured goods and material.....	48,791,238.61
Securities owned	1,731,870.29
Net current assets, consisting of cash and receivables, less payables.....	30,840,293.38
	<u>\$136,213,606.61</u>

Undisturbed bonds:

Canadian Consolidated Rubber Co., Limited	\$2,600,000
General Rubber Co.....	9,000,000
	<u>11,600,000.00</u>
	<u>\$124,613,606.61</u>

The underwriting was arranged by Kuhn, Loeb & Co., and it is understood that the American International Corporation is also interested in the transaction, which seems to presage the further acquisition of plantation acreage in the Far East to insure an adequate supply of crude rubber. Subscriptions were solicited on January 17 at 96 $\frac{3}{4}$ per cent, and were largely oversubscribed when the books closed on January 23 to such extent that only about 60 per cent of amounts subscribed for could be allotted.

In this connection it is reported as probable that W. S. Kies, vice-president of the American International Corporation; C. B. Seger, vice-president of the Union Pacific Railroad, and J. S. Alexander, president of the National Bank of Commerce of New York City, will be elected directors of the United States Rubber Co. at an early meeting.

RUBBER FOOTWEAR PRICES.

AS was anticipated in the January number of THE INDIA RUBBER WORLD, the rubber footwear manufacturers sent out new price-lists the first of the year showing a material increase in the net cost of these goods to wholesalers and retailers. The United States Rubber Co. made a few changes in its gross price-lists, and these were confined to the red and white goods manufactured by that company by pressure process. The discounts of former years have been reduced to this extent: Last year first-quality goods were bought at 25 and 5 per cent off, with a further 5 per cent for early orders. On second quality the terms were 25, 5 and 10 per cent, besides the usual 5 per cent for early orders.

This year's discounts are 15 per cent off on first quality, and 15 and 8 per cent on second quality. On the differential brands, namely, Woonsocket, Meyer, Rhode Island and Jersey there is an additional 5 per cent. The discount for early orders is now allowed until the first of June for jobbers, who can, if they wish, allow this same 5 per cent discount until the first of May to their customers.

It will be seen that this makes a very considerable increase in the net cost of goods both to the wholesalers and retailers. Such portions of the orders given in 1916 which were not filled on December 31 were to be considered cancelled unless re-ordered by the customers. It is stated that although the company's sales were 15 per cent larger than the previous year, a large proportion of the orders remained unfilled because of lack of capacity of the factories, and it is expected that the coming year's business will surpass that of last year by a large amount.

COPY OF INDEX TO "Rubber Machinery" will be sent free upon request.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

ON December 28, George E. Hall, general manager and vice-president of the Boston Woven Hose & Rubber Co., of Cambridge, Massachusetts, entertained the heads of the 45 departments of the factory and business offices, at a dinner given at the City Club in Boston. The utmost good fellowship prevailed and a number of humorous "stunts," followed by a motion picture show, provided entertainment. Five reels showed the rubber industry from gathering the latex in a Brazilian forest, through the various manufacturing processes in the factory of the company, to completion in the form of the various products which the firm manufactures. This was supplemented by several reels along other lines, presenting pictures of comedy and human interest.

The Boston Woven Hose & Rubber Co. recently announced that, beginning January 15, all employees who had completed two years of continuous service with the company would be presented with an insurance policy amounting to at least \$500 and providing for an increase in value for each additional year of service from the above date. The company, as a reward for long service, also distributed gold pieces to employees of ten or more years' standing. The coins ranged from \$5 to \$20.

Honors seem to come thick and fast to Thomas A. Forsyth, president of the Boston Belting Co. Last month it was chronicled in this column that he had been made an honorary member of the Sigma Delta Sigma Fraternity—the first person outside the dental profession to be admitted to that society in the last 50 years. That the dentists of this country appreciate Mr. Forsyth's broad philanthropy, in giving to this city the great dental infirmary, was further evidenced last month when over 500 dentists from all over the country tendered him a dinner, while members of the profession, not only in this country, but even as far away as



THE FORSYTH CUP.

Japan, observed "Forsyth Day" in his honor. There were present the Governor of Massachusetts, the Mayor of Boston, the presidents of Harvard University and Tufts College, the president and the president-elect of the National Dental Association, the president of the Massachusetts Dental Association, Dr. Harvey W. Wiley, and many other distinguished men. Mayor Curley in his address announced that a street near the Boston Belting Co.'s factory had been renamed Forsyth street, and Dean Friesell, of the dental department of the University of Pittsburgh, reported that its trustees had voted to confer on Mr. Forsyth the degree of Doctor of Laws. But the feature of the evening was the presentation of a beautiful silver loving cup subscribed for by dentists all over the world. This massive cup, shown by an accompanying illustration, is of graceful design, depicting in high relief 18 figures of children in graceful postures, while around the rim runs an appropriate inscription. Mr. Forsyth accepted the cup with a brief and graceful expression of appreciation and the happiness which this gift, as

well as the work of the infirmary, would always give him. The affair was a fitting tribute to the man who has spent millions of dollars to alleviate suffering by the children of this city.

* * *

A fire starting in the churn room of Stowe & Woodward Co., Newton Upper Falls, Massachusetts, rubber manufacturers and proofers, practically demolished the entire spreading plant, with an approximate loss of \$20,000. Fortunately, the power plant, storehouse and hard rubber department were not damaged, and the company is now making plans to put up a cement building somewhat larger than the former wooden building and expects to be running again in two or three months. Meanwhile, orders in the spreading line are being cared for at the Campello, Massachusetts, factory of the company.

* * *

Another fire, which might have been much worse, was that at the Converse Rubber Shoe Co.'s plant in Malden on January 21, where a frame structure, used as a temporary storehouse, gave the firemen three hours of lively work, keeping the flames away from another building in which solvents were stored. The loss to the company was comparatively small.

* * *

Superintendents and foremen cannot impress too strongly upon workmen the danger attending the handling of gasoline, naphtha and similar solvents. Only last month two men in the employ of Bartels & Thelan Shoe Co., Chelsea, were sent to the storehouse to get some rubber cement. The storehouse was dark, and one of them held a match over the bung-hole of a cement barrel. The result was an explosion; both men were severely injured and several hundred employees rushed from the factory in disorder, returning, however, upon learning that there was no further danger. The fire department was called out, but the monetary loss was small.

* * *

An accident occurred last month in a dry-cleansing plant in Lewiston, Maine, where nails in a workmen's heel struck a spark which ignited gasoline vapor, and in an instant the whole establishment was ablaze and a loss of \$4,000 resulted. This is a phase of the danger from rubber solvents which it may be well to recall. Many factories nowadays have concrete floors, and friction from heel-nails is quite likely to create a spark, with disastrous results. The moral is for rubber employees to wear rubber heels.

* * *

The main shaft at the Boston Rubber Shoe Co.'s plant in Malden was fractured a few weeks ago, requiring a shutdown of two days in several of the departments. This shaft was 17 inches in diameter and was driven by a 1,200-horsepower engine. A number of emergency motors were brought into use, thus enabling some of the machinery to be run. The break happened at an unfortunate time when the factory was running to full capacity on orders, in many departments double shifts of workers being employed.

* * *

The Hood Rubber Co., East Watertown, has completed plans for the erection of a foundry and pattern shop on land contiguous to the factory. The new building will measure 80 by 160 feet, two stories high.

* * *

The prevailing high footwear prices and the growing demand for rubber-soled shoes, also the increasing call for rubberized fabrics, rubber and fiber compositions in the manufacture of footwear, were concisely explained by W. E. Barker, manager of sales of the United States Rubber Co., at a recent luncheon of the National Shoe Wholesalers' Association in Boston, when he stated that American stocks of manufactured footwear today

total \$15,000,000 less than a year ago, and \$8,000,000 less than two years ago. In this connection W. H. Palmer, of the United States Rubber Co., at the annual convention of the National Shoe Retailers' Association in Cincinnati, Ohio, not long ago, reviewed the remarkable growth of the rubber sole business and also stated that the shipments by his firm of canvas upper, rubber-soled footwear for the year ending August 31, 1907, amounted to 149,374 cases, but that since then the business has increased more than fourfold.

* * *

The J. W. Wood Elastic Web Co., of Stoughton, Massachusetts, is erecting the second large addition to its plant during the past year. The new building will be 60 by 125 feet, of especially heavy construction, two stories high, with walls of reinforced concrete, and when completed, the work which has been done at Brockton in the past will be taken care of in the new building.

* * *

Dr. Warren K. Lewis, professor of chemical engineering at the Massachusetts Institute of Technology, Cambridge, has been appointed consulting chemist for the Goodyear Tire & Rubber Co., Akron, Ohio. He will still hold his professorship at this great technical institution, taking trips to Akron as occasion may demand.

* * *

Francis H. Appleton, the well-known manufacturer of reclaimed rubber, was reelected Chief Rabban of Aleppo Temple, Mystic Shrine, in this city, last month. Captain Appleton stands very high in Masonic circles. He was also one of the committee to visit England a few years ago, to tender to King George the certificate of honorary membership in the Ancient and Honorable Artillery of this city.

* * *

Lester Leland, vice-president of the United States Rubber Co., was reelected a director of the American Trust Co. at its annual meeting. Mr. Leland resigned his position as director of the Second National Bank, the vacancy being filled by Matthew C. Brush, president of the Boston Elevated Railway.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

EMPLOYEES of the Firestone Tire & Rubber Co. are responding enthusiastically to the newly inaugurated stock distribution plan whereby it is possible to become a stockholder in the company. The plan provides for the distribution of one to ten shares of stock to each employe, according to term of service. It can be purchased at \$100 per share, although the present market value is about \$140. Easy payments can be made for five years, during which period the stock must remain on deposit with the company.

At the annual dinner to the 500 superintendents, foremen, department heads and their wives held recently in the Firestone clubhouse, President H. S. Firestone outlined the company's offer and its object. "We want to hold the interest of our employes," he said. "The only way to do that properly is to give them a real interest in the company. It is better for the company and better for the men. If you have a real interest in the work you do, there is nothing in the world that gives you more pleasure than your work, and at the same time you become much more efficient."

R. E. Lee, R. E. Glass, L. B. Walters and R. C. Lepper also spoke at the dinner, and J. W. Thomas, general superintendent, acted as toastmaster. Motion pictures and music furnished pleasing entertainment.

President Firestone recently purchased a beautiful winter home in southern Florida, where he and his family are to spend the latter part of the winter.

The books of The B. F. Goodrich Co. have been closed for the purpose of compiling the full annual report for the year 1916. The results are as follows, subject only to the verification of public accountants and auditors:

After making full provision for all maintenance charges, depreciation, bad and doubtful debts, and other items which it was deemed wise to take out of the year's earnings, the net profits for the period amount to approximately \$9,550,000.

This amount, added to the surplus carried over as at December 31, 1915, of \$10,580,000, shows undivided profits of approximately \$14,900,000 after deducting the four quarterly dividends of 1¼ per cent on the preferred and 4 per cent on the common stock outstanding, together with the following provisions: \$700,000 for the redemption of preferred stock; \$121,460 representing the reduction of preferred stock purchased from cost to par, and \$100,000 appropriated for pension fund.

At the regular quarterly meeting of the directors held on January 24 a dividend of 3½ per cent was declared on the preferred stock, payable 1¼ per cent April 2, and 1¼ per cent July 2.

A quarterly dividend of 1 per cent was declared on the common stock, payable May 15, 1917.

The directors voted, subject to the approval of the stockholders at their annual meeting March 14, to retire 9,000 shares of preferred stock prior to July 1, 1917. This makes a total retirement of 36,000 shares covering the charter provision for retirement of preferred stock up to July 1, 1917.

The net earnings for 1916 were less than those of 1915, which is largely due to the fact that advances in selling prices have not kept pace with rapidly increasing costs. However, the directors consider the results satisfactory under the conditions which prevailed.

During the past month 50 representatives of the waterproof clothing department of The B. F. Goodrich Co. met at the home office for a week's convention. Formerly, mere utility governed the waterproof garment situation but, nowadays, cut and style and originality play as large a part in this type of clothing as in any other. J. W. Jones, sales manager of this division of the Goodrich company, stated that the finest artists and models obtainable are employed in creating new models from year to year in keeping with other styles in men's and boys', ladies' and misses' clothing.

W. O. Rutherford, general sales manager of the Goodrich company and a director of The Motor and Accessory Manufacturers, was one of the prominent visitors at the automobile show in New York City during the past month.

Henry C. Geer, formerly general foreman of the Goodrich company, was recently placed on the retired list, after 35 years' service, following a remarkable record of only three weeks' absence, caused by illness, in all that time. He is now taking a prolonged vacation at Miami, Florida. When Mr. Geer entered the employ of the Goodrich company, its products consisted of rubber rolls for wringers, solid rubber tires for high-wheeled bicycles, and rubber hose, while to-day the company manufactures over 10,000 different rubber articles.

* * *

Men from practically every quarter of the civilized globe take part in the making of Goodyear products, and an interesting organization formed by The Goodyear Tire & Rubber Co. to aid in the true Americanizing of these varied elements is the Goodyear Cosmopolitan Club, composed of workmen representing 20 different nationalities. The charter members are men of prominence and influence among the men of their respective nationalities and with the utmost enthusiasm for American institutions and ideals, and will undoubtedly be instrumental in promoting fraternal feeling.

The previously mentioned citizenship classes maintained by the Goodyear company for alien workmen are also a valuable aid

in furthering an intelligent conception of American principles of government and other matters calculated to increase the usefulness of these men in the land of their adoption. In this connection it is interesting to note the new division of the company's school which has been inaugurated for deaf mutes, about 200 of these "silent" workers now being employed at the Goodyear plant.

Charles Seiberling, son of C. W. Seiberling, vice-president of the Goodyear company, and L. G. Odell, of the crude rubber department, recently departed for India on an extended tour.

* * *

At the recent annual meeting of the General Tire & Rubber Co. the officers were reelected and the following directors named: M. O'Neil, W. F. O'Neil, W. E. Fouse, G. F. Burkhardt, J. A. Diebolt and T. F. O'Neil. M. O'Neil is president; W. F. O'Neil, vice-president and general manager; W. E. Fouse, secretary and Charles Herberich, treasurer. A quarterly dividend of 1¼ per cent was declared on the \$200,000 issue of preferred stock. The company has also \$300,000 outstanding in common stock and is building an addition to its factory in East Akron.

* * *

The annual report of the Portage Rubber Co. recently submitted to shareholders showed a net profit of \$232,000. This is approximately 16 per cent on the present outstanding stock and shows a net increase of 81 per cent over the previous year. B. J. Wildman, former Chicago manager, was elected secretary to succeed W. J. Anderson, who is no longer with the company.

* * *

The Mohawk Rubber Co. has increased its common capital stock from \$500,000 to \$1,000,000. The company retains the \$50,000 of preferred stock which it had, thereby securing a total capitalization of \$1,050,000. The new stock has not been placed on the market, but will be partially distributed among the stockholders as a stock dividend, and the balance held in the treasury temporarily. This increase was made necessary by recent additions to the factory and increased business.

* * *

The Akron Biltwell Tire & Rubber Co., notice of whose incorporation appears elsewhere in this issue, will shortly commence the erection of a factory in the eastern part of the city. The main building will be of brick construction, 60 by 150 feet, two stories high.

* * *

John W. Herron, formerly assistant to H. H. Henderson, succeeds the latter as manager of the Akron office of Henderson & Korn, crude rubber importers, Mr. Henderson going to the New York City office of the company.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber factories throughout Rhode Island continue to be rushed to their capacity with business in all lines, with no indications of any immediate cessation either in orders or operations. The makers of tennis and other shoes are especially busy. Nearly all of the plants have been closed for a few days each for the taking of an inventory, but have resumed under a higher pressure than ever, frequent newspaper warnings that retail prices on rubber goods were to be advanced having resulted in exceptional demands.

One of the greatest handicaps that the rubber manufacturers in this vicinity have had to face during the past year and a half has been the scarcity of help of even mediocre ability, while expert rubber workers have been almost priceless. Even the payment of the highest scale of wages ever paid in Rhode Island rubber plants has failed to secure the desired number of operatives.

The O'Bannon Corporation, with extensive holdings in West Barrington and East Providence, has purchased the International Rubber Co.'s plant, also at West Barrington, and will change the firm name to the International Rubber Cloth Co. Richard LeBaron Bowen, general manager, announces extensive enlargement, and the employment of fully a hundred more operatives. The International Rubber Co. has been engaged for some time in making automobile tops, rubber coverings and other goods, employing approximately 125 persons. The O'Bannon Corporation also has a large plant at Phillipsdale, known as the Nonnabo Chemical Co., where cellulose products are made, and a second at West Barrington, where artificial leather is manufactured. The concern will employ approximately 1,500 persons in its three plants.

* * *

Another phase of the various suits against alleged infringement of the so-called Osburn patents for flexible electrical conduits was brought up before Judge Arthur L. Brown in the United States District Court for Rhode Island recently, with the hearing of the case of W. C. Robertson *et als* against the Tubular Woven Fabric Co., of Pawtucket.

According to the allegations made by the plaintiffs, the Tubular Woven Fabric Co. is now making a conduit which is an infringement of the Osburn patent, as was the original product of this concern, which it stopped manufacturing when it was adjudged guilty of infringement through previous proceedings. The plaintiffs have therefore now brought a supplementary bill to determine whether the new product of the defendants is also an infringement. Two days were required in the presentation of the arguments, during which numerous samples of the conduits manufactured by the two companies were brought into court for inspection. The matter was taken under advisement by Judge Brown.

* * *

The Millbury Rubber Co., Millbury, Massachusetts, has been incorporated under the laws of Massachusetts, with a capital stock of \$90,000, in which Worcester men are largely interested. The new concern will take over the plant of the Stoddard Rubber Co., Inc., and operations will begin in a few days.

The new company is authorized to issue \$30,000 in preferred stock and \$60,000 in common stock, practically all of which will be held in Worcester. The permanent officers of the corporation under the reorganization are as follows: DeForest E. Martin, president; Albert W. Blackmer, treasurer and clerk; DeForest E. Martin, Albert W. Blackmer, Warren F. Holden, Albert F. Richardson and Francis H. Dewey, Jr., directors. Automobile tires and other rubber goods will be manufactured on an extensive scale, new equipment being installed and additional employees taken on as rapidly as business conditions warrant.

* * *

The great success that has attended the introduction of specialized sand blast machines in rubber plants for use in automatically cleaning automobile truck tire rims, cutting off any barbs that may occur, and in reducing inequalities has caused an increasing demand during the past year. H. J. Astle & Co., Providence, has installed several in the United States, also in Canada, England, South America and elsewhere. At present two large machines are being constructed, one for the Russian-American India Rubber Co.'s plant at Trengolnik, Petrograd, Russia, and the other for the Canadian Consolidated Rubber Co., Limited, Kitchener, Ontario.

* * *

The Tamarack Co. has started the erection of a large addition to its Pawtucket plant to take care of heavy orders for the manufacture of automobile tire fabric.

The new building will be 110 by 193 feet, of mill construction, three stories and basement. It will increase the floor space by

80,000 square feet, and will give employment to 1,200 more men about the first of March.

Arthur Carr has been made general superintendent of the Revere Rubber Works, Providence. Although but little more than 30 years of age, Mr. Carr has been in the employ of this concern for several years, and foreman of at least half a dozen of the departments of the plant. He is now at the head of all departments, being assistant to factory manager W. H. Waite.

The Arcade Rubber Co., which has taken over the store of the Decker Rubber Co., 76 Weybosset street, Providence, is being conducted by the Direct Rubber Co., 47 Pine street, of which Elwyn C. Thayer is treasurer.

John M. Norris, who was employed for many years with the National India Rubber Co. at Bristol, and later as foreman in the calender department of the International Rubber Co. at West Barrington, died at the State hospital at Howard, January 17, after a long illness. He was 53 years of age and a native of Bristol, where he has a wife, two sons and a daughter.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

ONE of the most important happenings for a long time in the rubber field of Trenton was the formal reorganization this week of the Empire Rubber and Tire Co., with a capital of \$1,500,000 preferred and \$3,000,000 common stock. The new president, succeeding General C. Edward Murray, is J. E. Baum, president of the Supplee-Biddle Hardware Co., Philadelphia, Pennsylvania, and a director of the Corn Exchange Bank. General Murray still retains a substantial interest in the company, although he disposed of some of his stock at the time of the reorganization. His son, C. Edward Murray, Jr., is vice-president, and his other son, J. Cornell Murray, is treasurer of the company.

Other officers of the new company, not enumerated above, are: E. B. McKay and J. A. Perkins, vice-presidents; A. Boyd Cornell, secretary. The board of directors is made up of J. E. Baum, General C. Edward Murray, J. Cornell Murray, E. B. McKay and F. A. Forbes.

Mr. McKay was for many years Chicago manager of the Empire company. A. Boyd Cornell, the secretary, has also been long identified with the concern. Some of the new capitalists are said to be heavily interested in automobile manufacturing, and this of itself, it is thought, will aid in greater development of the Empire plant. It is expected that the present capacity will be about doubled before the end of the present year.

Justice Kalisch, of the New Jersey Supreme Court, has handed down an opinion reversing the decision of Judge Marshall, of the Mercer County Court, in the case of Arthur F. Foley, traveling salesman for the Home Rubber Co., who was drowned when the steamer "Lusitania" was torpedoed in May, 1915. Mrs. Foley brought suit for \$3,000 under the workmen's compensation act. An insurance company defended the suit and the Home Rubber Co. was not a party to the action. Judge Marshall decided against the widow.

Justice Kalisch, in reversing this decision, sets forth some legal facts which will doubtless be of interest to all employers of traveling men. Justice Kalisch says that Judge Marshall's determination of fact was apparently founded upon a misconception of the legal principle applicable to it. The trial judge, he states, appears to have disposed of the facts upon the mistaken notion that in order to hold a master responsible for an injury to his employe as a result of an accident, the accident must be one of which the actual negligence is the natural and proximate cause. It is clear from a plain reading of the statutes, Justice

Kalisch holds, that the question of negligence does not enter into the consideration at all where compensation is sought under section two of the act. It was advanced for the defendants that the torpedoing was something not reasonably to have been anticipated. The rubber company, Justice Kalisch holds, knew that Foley, its agent, was booked upon the "Lusitania" and it was legally bound to take notice that because of a condition of war between Germany and Great Britain, ships might be captured or sunk. Precedents show that if the vessel had been lost through collision, fire or storm, the mishap would have been construed as one arising out of Mr. Foley's employment. The fact that the ship was lost by an extraordinary peril does not make it less an accident arising out of employment. The case will now be placed on schedule for another trial.

A case of history faking which aroused interest throughout New Jersey and in which the late Frank A. Magowan, one-time rubber king, was the central figure, has just been rectified, much to the satisfaction of his friends. Many years ago Mr. Magowan gave unsparingly of time and money, and was one of the prime movers in a plan to have the Battle of Trenton commemorated by a suitable monument. Finally, after years of effort, Congress agreed to bear part of the expense. Mr. Magowan was appointed a member of the Battle Monument Association, composed of about a dozen prominent men, in charge of the erection of the monument and its care after its completion. No appointments were to be made to fill vacancies caused by death, and following the demise of the last member, the work devolved upon the State. After Mr. Magowan met with reverses some years ago and finally drifted low on the social and financial scale, his name was secretly chiseled from the bronze tablet in the monument and the name of another man substituted. The official picture of the Monument Association was also doctored so that the face and head of another man was placed where that of Mr. Magowan had been. Now, thanks to the work of his son and the efforts of a local newspaper, the wrong has been righted and both name and picture have been restored.

The Ajax Rubber Co. has increased its capital stock from \$5,000,000 to \$10,000,000.

W. J. B. Stokes, the rubber manufacturer, has been reelected a director of the Broad Street Bank.

The newly finished State museum was opened this week in the State House. One of the exhibits is from the United & Globe Rubber Manufacturing Cos. It shows rubber in process of manufacture from a crude state to a finished automobile tire. This firm is erecting a \$1,000 addition to its plant.

A dinner was recently given by the officers of the Thermoid Rubber Co. in honor of the branch managers of the concern who were in Trenton for an annual conference. Those present were: J. Oliver Stokes, president; W. J. B. Stokes, treasurer; Robert J. Stokes, secretary; Dale O. Pohlman, sales manager; Joseph Liston, Chicago, Illinois; George W. Whittemore, Boston, Massachusetts; L. T. Kuhl and J. W. Pohlman, Indianapolis, Indiana; J. N. Kirk, Jr., New York City; Harold F. Blanchard, Philadelphia, Pennsylvania.

A RUBBER SPONGE PEN-WIPER.

A suggestion for cleaning steel pens, said to be decidedly more efficacious than the ordinary pen-wiper, is to place a rubber sponge, wet with glycerin, in a glass holder, the sponge remaining moist and always ready for use. The ink is absorbed from the pen by contact with the glycerin, a thin layer of which adheres to the pen, preserving it and making it take the ink at once when dipped.

The India Rubber Trade in Great Britain.

By a Special Correspondent.

CONGESTION is general in the rubber trade at the present time in this country, and is especially affecting the fabric proofing industry, which is flooded with goods for rubberizing. The government has obtained cloth too quickly for proofers to handle it. Heavy twills for trench capes are monopolizing the activities of the proofing industry. It is stated that one firm alone is rubberizing from four to five thousand pieces of this fabric weekly and this rate of output promises to continue far into February.

RUBBER FOOTWEAR.

Recent snow storms found retailers quite short in supplies of rubber footwear; most were sold out the first two days of the "slushy" weather, despite the partial relief afforded by American supplies.

MECHANICAL GOODS.

Mechanical rubber goods continue in good demand, and all kinds of molded articles are being sought in large quantities. The scarcity and high cost of leather has greatly increased the demand for rubber and fabric belting. Large orders were recently booked for armored hose for government purposes and great quantities of trench hose are being taken by the armies in France, so that the rubber hose people have their hands full.

ERASERS.

Austrian erasers are being replaced by an American rubber composition which well answers the purpose but wears much faster than pure rubber. These American erasers are sold to dealers on cards of one or two dozens and retail at a half penny (1 cent) each.

DRUGGISTS' SUNDRIES.

The government is purchasing large quantities of fine rubber sheet and it is freely stated that far more could be used than can be produced.

Waterbottles are selling faster than the proverbial hot cakes; so are air cushions, especially those of cheap Japanese makes.

Business in rubber toys and similar materials is very brisk. Celluloid is scarce and a tough quality of china is being substituted for it by London doll manufacturers.

A large Christmas business was done in rubber-lined ties. Their great merit lies in the fact that the rubber prevents creasing, and the application of a hot iron rapidly restores the tie to something approaching its original freshness.

PATENT VULCANIZATION ACCELERATORS.

The use of any means for saving either time or labor is of vast importance to our rubber industry at the present time. The North British Rubber Co., Limited, of Edinburgh, recently applied in the Patents Court for Board of Trade license to use four German patents by the Bayer Co., of Germany, for an accelerating process in the vulcanization of rubber in which piperidine or its homologues are active elements. The Board of Trade has not yet decided the terms on which the license will be granted.

NORTH BRITISH RUBBER CO. EXTENSIONS.

The demand for this company's tires has been such since the outbreak of the war that it has been found necessary almost to double the extensive tire making plant. The present department has been working night and day without cessation, but has proved altogether inadequate to meet the rapidly increasing demand since the outbreak of the war.

RUBBER AND POTTERY.

A direction in which there may be scope for increased use of rubber is the direct printing of pottery in one or more colors. The great obstacle to printing pottery has been that

it cannot be flattened like a flexible sheet of paper. If it is to be printed upon directly, it must be with the aid of some flexible, durable material that can be made to take the same shape as the pottery, that can be spread out flat to receive a coat of color from a roller, and that will, when pressed on the ware, leave a print; all qualities which rubber possesses to a marked degree. But, unfortunately, rubber stamping does not produce high-class work, even on paper, while on pottery it is even less satisfactory, except perhaps in the case of gold stamping, which it makes very clear, provided the design be simple.

At a recent meeting of the English Ceramic Society, however, W. Sherratt described a new development which may lead to a revolution in methods of direct printing on pottery.

Mr. Sherratt claims that rubber can now be prepared which will print equal to copper plate printing, and that the way is, therefore, cleared for a direct printing machine. He also claims that a machine has been devised for holding the improved rubber, for applying a coat of color to it, for shaping it to the object and printing on the pottery, and for drawing it away again to receive more color. The mechanism of this almost human device is said to be very complicated.

The machine will print up to 60 dozen articles in an hour (not counting any time for stoppages), and can be driven by a small electric motor of 1 horse power. Samples of ware printed by this system were exhibited.

THE SITUATION IN SCANDINAVIA.

By Our Regular Correspondent.

CONDITIONS in Scandinavia to-day are in many ways very similar to those in the United States. The demands of the warring nations for practically everything we can produce have caused prices to rise rapidly and many persons have profited thereby. The purchasing power of our people was never so great as it is now, and the rubber trade and industry are profiting by the prevailing prosperity and comparative freedom from foreign competition.

True, the restrictions of the British Government on rubber shipments are bearing heavily on both manufacturers and consumers of rubber goods, but this has not prevented the industry from experiencing unprecedented prosperity and development in all of its branches. The population of Scandinavia has been greatly increased by German refugees, money is circulating as never before, and our rubber manufacturers are getting "their prices" for all the goods they can turn out. No rubber goods are being exported, the home markets alone are more than our manufacturers can supply.

RUBBER FOOTWEAR.

As prior to the war, footwear is the chief item of our rubber manufacturers, but other branches of the industry have grown immensely and the scarcity of raw materials alone has prevented even more extraordinary development.

Automobile tires, that formerly were practically all imported, are now being produced in quantities that are immense when compared with what were being produced prior to the war.

INSULATED WIRES AND CABLES.

The high cost and scarcity of coal that has been general in Scandinavia since the outbreak of the war has caused rapid development of the wonderful water power of our mountains. Electric power plants have rapidly increased, especially in Norway. The result of this is that the demand for insulated wires

and cables is greater than ever before. In fact, the demand is so large that, despite the large capacity of domestic factories, which have more than doubled their output, almost a million dollars' worth of electric cables were imported into Norway alone during the year 1916.

RUBBER FACTORIES.

Scandinavian rubber factories are now up to date in every sense, and very large, though, of course, we make no attempt to compare them with the gigantic rubber factories of America. Our plants have grown immensely both in capacity and in efficiency during the past two years, and when peace is reestablished, foreign manufacturers, who now complain of the difficulties in the way of international trade, will hardly find their Scandinavian business better than it is under present conditions. Their tire business, however, will probably be an exception to this rule, for the automobile tires, both solids and pneumatics, that are now being produced in Scandinavia leave much to be desired and must be greatly improved if they are to compete successfully with good foreign products. In other lines, however, our manufacturers will not have to fear foreign competition, for they have learned to satisfy practically all of our requirements, even under the difficult conditions now prevailing. With ample supplies of raw materials they will probably be able even to enter the export field themselves.

HEADS TRAINED ABROAD.

Most of the managers, chemists, superintendents, and also many of the salesmen employed by Scandinavian rubber factories are men who have gained most valuable experience in schools, factories and business in America, England, Germany and France. Since the outbreak of the war, numbers of Scandinavians, who held responsible positions in various foreign countries, have returned to their native lands and are applying the most approved modern methods in our rubber and cable factories.

BRITISH RESTRICTIONS.

Besides curtailing the development of our rubber industry, the British restrictions on rubber shipments, coupled with the shortage of ocean tonnage, have seriously interfered with the automobile business which is so closely related to the rubber industry.

Only a few cars are produced in Scandinavia; practically all are imported and, since the war, there has been an increasing demand which is supplied chiefly by American companies. American cars arrive here without tires and, before a set of tires can be obtained for one of them, an old set must be turned in, which means that some other car must be put out of commission, or a number of cars deprived of their spare tubes and casings. All tires imported here must pass through London, and the strictest kind of supervision is exercised by both British and Scandinavian authorities to prevent tires or, in fact, rubber in any form, from reaching Germany.

The attitude of the people towards these vexations varies from one country to another, according to interests involved. In Sweden, where German refugees are far more numerous than in Norway or Denmark, and where the bulk of the trade is with Germans and Germany, the feeling created is hostile to the British action. It is argued that the export embargoes all Scandinavian governments have placed on all goods containing rubber should be sufficient guaranty for England, and that, consequently, the British restrictions are not justified.

In Norway and in Denmark, the opinions, as well as the interests of the people, lead them to feel that what is best for England is, in the long run, best for them. Despite all the Scandinavian export embargoes, considerable rubber has been smuggled into Germany at very big profit, and it was in order to check this that Great Britain, in accord with the several Scandinavian countries, developed the system which is now an obstacle to the sale of American cars in Scandinavia, and by which no one can buy a new tire without turning in an old one.

A contemplated visit in the near future to all the rubber factories in Scandinavia will soon result in a series of letters devoted to the various plants in Norway, Sweden and Denmark.

THE LYONS SAMPLE FAIR.

The Sample Fair, which occurs annually in Lyons, France, will be held from March 1 to March 15. Last year this fair, which is the successor of the heretofore great Leipzig Fair (now closed to the world because of the war), had 1,342 different exhibitors, representing manufacturers of the following countries: France, Italy, Great Britain, Canada, Russia, Spain, Portugal and the Orient, and a very large attendance of wholesale buyers from all over the world.

At that fair not an American manufacturer made an exhibit. Business to the amount of \$10,000,000 was transacted, and over \$8,000,000 more was offered, but refused because of the inability of manufacturers to make deliveries. An American committee, headed by George B. Van Cleve, of New York, organized by Mr. Piexotto, president of the American Chamber of Commerce in Paris, and comprising presidents of the chambers of commerce of the principal cities in this country, is endeavoring to have American manufactures well represented at the coming fair, which will be visited by wholesale buyers from Europe, the Orient and South America. It is estimated that their orders will aggregate \$40,000,000 to \$50,000,000.

CORK RIVALS RUBBER FOR WATERPROOFING IN FRANCE.

The French government recently placed orders for hospital sheetings and similar articles manufactured by a new method of proofing materials with cork, which is said also to give satisfaction for featherweight garments. It is waterproof, a non-conductor of heat and unbreakable. A special machine produces very thin veneer of an even thickness from black cork. The veneer is placed in chemical baths in order to remove the resinous parts, which render cork a more or less brittle substance. After this treatment the cork veneer becomes quite flexible, and compares favorably in this respect with thin leather. In fact the sheets can be folded and bent without breaking.

By combining the cork sheets with any suitable cloth, preferably a thin and strong cloth of good color, an excellent waterproof material is obtained. An adhesive preparation is used to cement the cork to the cloth; or, if a stronger garment is desired, the cork sheets are placed between two layers of cloth.

Fabric prepared in this manner is said to have a decided advantage over ordinary waterproof materials, because it is porous, permitting ventilation where the ordinary waterproofing prevents it. Of course the cork is very light, and an aviator's coat made of this combination is said to be the lightest on the market.

THE RUBBER TRADE IN JAPAN.

By a Special Correspondent.

IMPORTS OF CRUDE RUBBER.

THE Japanese importation of crude rubber during the last year was estimated to be 3,903,552 pounds [\$1,715,796.50], and showed 1,595,771 pounds [\$642,479.50] increase over that of the previous year.

This increase is the result of the great demand for rubber goods, and the new factories organized to meet this demand, among them Futaba, Minatogawa and Ishiyakawa have their plants near Osaka. In Tokio eight new factories were established, and other old companies enlarged their capacities to help fill the shortage caused by the war.

As the number of manufacturers increases, the price of the manufactured goods goes down. For instance, a few years ago a pair of bicycle tires cost from \$2.50 to \$3, but now the price is only about 90 cents a pair.

Factories in Tokio or Osaka received orders for 60,000 pairs of

tires for exportation. Before the war tires for rickshaws for use in China and other eastern colonies, were imported from Germany, but for the last two years Japanese tires have taken the place of those of German make.

Certain companies in Japan had special orders from England for automobile tires, and it is estimated that they made ten times as many as they had expected. The manufacturers at present want more orders for exportation than for the home market, for the domestic price has been low for some time. Previously crude rubber was imported from Singapore, but after the prevention of exportation, most of the raw material came from Ceylon. This Ceylon rubber is said to be superior in quality to that of Singapore, but as the price is a great deal higher, and as it takes a longer time for transportation, the manufacturers prefer to import their material from Singapore, and in some way, despite the law, they have succeeded in obtaining material from there since last April.

Until the beginning of the war no rubber was imported from Hawaii, but when the exportation from Singapore was stopped, the manufacturers obtained some raw material from there. Now that rubber is again being imported from Singapore, the manufacturers get very little from Hawaii, although the rubber goods business depends largely on this small supply, and would be seriously injured if it were stopped, even temporarily.

The finer quality of rubber required for certain goods is imported from England. A few of the manufacturers get this finer material from the United States, but as it is a good deal more expensive than the English material, the majority of them prefer the English market.

THE EXPORTATION OF TIRES.

The exportation of tires for last year amounted to 2,486,569½ pounds [\$1,706,314.50], showing an increase of 1,630,177½ pounds [\$1,663,179.50] over that of the preceding year. Until the war began, European and American tires were used principally, but since then the Japanese manufacturers have had to supply them. At present orders from Russia are pouring in, and the export for Russia this year is far in advance of other years. The exportation of rickshaw tires makes up one-half of the whole amount. These are made mostly by the Dunlop, the Oriental Rubber, the Mitatsuchi and the Nippon rubber companies.

Automobile tires are manufactured mainly by the Kakinchi and the Dunlop companies. The sizes of these tires differ according to the countries from which the orders come. Sometimes the manufacturers have to use meters instead of inches, and on this account the work is rather complicated. The average sizes, though, vary between 28 by 3 and 35 by 5. Manufacturers are also receiving large orders for solid tires, and the demand for these, as well as for the others, is rapidly increasing.

ECONOMIC ADVANTAGES.

From an economic standpoint the Japanese unquestionably hold certain advantages in the rubber industry of the world. They are a frugal people, practicing every possible economy, so that wages and the cost of living are remarkably low. Women occupy about 75 per cent of the positions in labor, both in factories and agriculture. As employed at hand-made tires they receive from 12½ cents to 24 cents per day of 12 hours. The highest wage paid to male superintendents and foremen is 64 cents, whereas the average workman receives only 25 cents per day. This in large measure explains the surprisingly low prices at which rubber goods of Japanese manufacture are obtainable here.

PICTURESQUE JAPANESE ADVERTISING.

That Japanese manufacturers appreciate fully the power of attraction of illustrations in their advertising is indicated by the accompanying reproduction from a page in "The Gomu-Sekai," the Japanese rubber trade paper. This striking design heads the



advertisement of druggists' sundries of Skinjiro Muneta, 20, Nichome, Doshomachi, Higachiku, Osaka.

SIAM'S IMPORTS OF RUBBER GOODS.

ACCORDING to American consular advices, Siam's imports of rubber goods for the last three fiscal years ended March 31, 1916, have shown the following variation: 159,115 pounds, valued at \$119,507, for 1914; 143,506 pounds, valued at \$103,702 for 1915; and 157,931 pounds, valued at \$127,507, for 1916. The imports for 1916 included 58,565 pounds of automobile tires, valued at \$51,978; 13,380 pounds of cycle tires, valued at \$14,551; 41,323 pounds of other kinds of tires, valued at \$16,795; and 44,630 pounds of all other rubber manufactures valued at \$44,183.

SOURCES OF IMPORTS.

The sources of rubber goods imports for the fiscal year ended March 31, 1916, were: From the United Kingdom, automobile tires, \$39,902; cycle tires, \$4,941; other kinds of tires, \$12,771; and all other rubber manufactures, \$11,155. From United States, motor car tires, \$872; cycle tires, \$3; all other kinds of tires, \$134; and all other manufactures of rubber, \$1,002. From Italy, cycle tires, \$395. From Japan, tires, \$17; and all other rubber manufactures, \$2,584. From Singapore, automobile tires, \$39,902; cycle tires, \$9,011; all other kinds of tires, \$3,873; and all other rubber manufactures, \$27,791. From all other countries, \$1,651 worth of rubber manufactures other than tires.

Taking the totals of all rubber goods imported during the fiscal year ended March 31, 1916, it will be noted that \$80,591 worth is credited to Singapore, a British port of transshipment; \$40,226 to the United Kingdom; \$2,011 to the United States; and \$4,448 worth to all other countries.

TIRE MARKET.

The roads in and around Bangkok, the capital of Siam, are favorable to the use of rubber-tired vehicles, and the use of the automobile and bicycle is steadily increasing. The total number of motor cars on the register up to April 1, 1916, was 875. Rubber tires are used for horse-drawn vehicles, as well as for the rickshaws drawn by the Chinese coolies.

During past years American manufacturers apparently have not displayed any active interest in Siam's needs for rubber goods, but in 1916 an American concern established an agency for its automobile and other tires, and American salesmen are said to have taken fair orders for other kinds of rubber goods.

The import duty on all kinds of rubber goods is 3 per cent ad valorem.

BELGIAN CONGO RUBBER EXPORTS.

The latest available statistics of the foreign trade of the Belgian Congo are for the year 1915 and show that exports of crude rubber amounted to 4,428,945 pounds, against 4,892,166 pounds exported the previous year.

Rubber Planting Notes.

RUBBER TAXATION IN THE FEDERATED MALAY STATES.

ACCORDING to recent advices from the Far East, there is in Malaya considerable agitation with the object of adding still further to the export duty on crude rubber.

At the present time the export duty is 2½ per cent ad valorem.

It is suggested that at the next Federal Council of the Federated Malay States a motion may be introduced to provide for an additional export duty of one Straits Settlements dollar per picul [\$0.567 per 133½ pounds] to be levied upon all crude rubber exported during the year 1917. In fact, there are rumors of a still higher tax being imposed.

STRAITS SETTLEMENTS RUBBER INDUSTRY AND TRADE.

The American Consul at Singapore, Straits Settlements, reports that the development of the rubber industry in the Malay Peninsula has seriously affected the cultivation of most of the other agricultural products of the country. The cultivation of rice, for instance, was first supplanted in large areas by coconuts and later by rubber. From the cultivation of rice the native was able to work out a bare livelihood, but with a small rubber plantation he has the possibility of becoming in a few years a comparatively rich man.

There were imported in 1915, 23,114 tons of crude rubber from the Malay States, 2,198 tons from the Netherlands Indies, and 709 tons from other countries. The figures in 1914 were 9,661 tons, 556 tons, and 274 tons; and 4,073 tons, 188 tons, and 189 tons in 1913.

The exports of crude rubber from the Straits Settlements in 1915 are given as 12,824 tons (value \$13,744,621) to the United Kingdom; 21,075 tons (value \$25,598,597) to the United States, and 4,383 tons (value \$1,776,367) to other countries. In 1914 they totaled 13,376 tons, 4,510 tons, and 2,220 tons, with 7,168 tons, 2,508 tons, and 731 tons, the corresponding figures in 1913.

INCREASED RUBBER EXPORTS FROM SUMATRA.

The American consul at Batavia, Java, reports that exports of plantation rubber from Belawan, Deli (Sumatra), for the first eight months of 1916 amounted to 19,947,704 pounds, compared with 8,300,817 pounds in the corresponding period of 1915. Shipments to the United States increased from 2,309,072 to 5,549,025 pounds. This indicates continued growth in the trade with the United States, which had previously leaped from 67,200 pounds in 1914 to 4,074,560 for the entire year 1916. The figures for eight months are:

Countries.	1915.	1916.
United States	2,309,072	5,549,025
Great Britain	4,517,429	3,863,088
Netherlands	948,158	31,392
Straits Settlements	466,158	1,503,999
Totals	8,300,817	10,947,704

DUTCH EAST INDIES RUBBER TRADE.

The latest complete official reports on the rubber trade and industry in the Netherlands East Indies now available are for the calendar year 1915.

As has already been stated in THE INDIA RUBBER WORLD, in consequence of the trouble experienced in shipping merchandise to the United States via the Netherlands at the beginning of the war, all goods from Sumatran ports to the United States in 1915 were shipped either via Java by direct steamer to New York, or via Singapore and Hong Kong to San Francisco and Seattle.

The direct monthly service to the east coast of the United States being found insufficient to meet the increasing demand

for cargo space, was changed to one of three weeks, and still all boats sailed with all the cargo they possibly could carry. Freight rates to New York had increased about 50 per cent by the close of the year, and shippers found that they could send their goods to American Atlantic ports via San Francisco and rail at less expense than by sending by direct steamer from Java to New York.

EXPORTS FROM JAVA.

Of the total crude rubber exports amounting to 14,262,235 pounds, 4,732,264 pounds went to the United Kingdom, 2,831,748 pounds to the Netherlands, 1,024,423 pounds to the Straits Settlements, and 11,000 pounds to France.

Exports of gutta percha amounted to 678,269 pounds; all went to the Netherlands, as did also the exports of gutta jelutong, which amounted to 1,584 pounds.

EXPORTS TO THE UNITED STATES.

Exports of crude rubber to the United States in 1915 amounted in value to \$5,918,570, against \$338,315 in 1914; those of gutta jelutong amounted to \$45,353, against \$4,969 the previous year, and exports of gutta percha were valued at \$31,533 against \$10,007 in 1914.

RUBBER CULTIVATION IN THE NETHERLANDS INDIES.

A report of the International Association for Rubber Cultivation in the Netherlands Indies estimates the total area under rubber in the islands of Sumatra and Java at 570,000 acres, about half of the total capital involved being English, the Dutch interest coming next, while France, Belgium and the United States are represented in the balance. The export of crude rubber from the Dutch possessions for 1915 is given at 18,765 metric tons, of which 11,307 tons came from Sumatra and 7,458 tons from Java. In 1914 the total export was 10,046 tons, of which 6,234 tons came from Sumatra and 3,812 tons from Java. This illustrates the rapid growth of the industry in recent years, and in the case of plantations on the east coast of Sumatra the development of the estates would appear to have been particularly rapid.

CEARA RUBBER FROM NIGERIA.

Reporting on two samples of *Manihot* rubber received from government plantations in Nigeria for analysis and tests, the British Imperial Institute states that the first sample had been prepared by a native from trees three years old, having an average girth of 15 inches at 3 feet from the ground. Sixty trees were tapped 14 times during a period of one month, the total yield of dry rubber being 118 ounces. The rubber was dark brown and in the form of thin, rough sheets. It was in good condition, containing only a small amount of impurities in the form of bark. Its physical properties were quite satisfactory.

The results of chemical examination were as follows:

Loss on washing (moisture and impurities).....	Per cent..	5.3
Composition of dry washed rubber:		
Caoutchouc		83.1
Resin		5.3
Protein		9.9
Ash		1.7

The sample was valued at 2s. 1d. per pound in London, with fine hard Para at 2s. 6¼d. per pound, and dark-brown plantation Para crêpe at 2s. 4d. per pound.

The rubber, although derived from young trees, compared favorably in composition with many samples of Ceara rubber previously examined by the Imperial Institute.

The second sample had been obtained from 96 trees which were tapped 26 times during the months of May and October.

During the intervening four months the trees were allowed to rest. They were from three to four years old and varied in girth from 18 to 20 inches at 3 feet from the ground, the majority being about 20 inches. Half of the trees had been tapped during the previous year, but the remainder were being tapped for the first time.

The sample consisted of rough sheet rubber, in pieces measuring about 5 inches square. The color varied from pale to dark brown, but many of the pieces were whitish on the surface. The physical properties of the rubber were good.

A chemical examination gave the following results:

Loss on washing (moisture and impurities).....	Per cent..	8.0
Composition of dry washed rubber:		
Caoutchouc		84.7
Resin		6.3
Protein		7.7
Ash		1.3

The rubber was valued at 2s. 6d. per pound in London (April 3, 1916), with plantation Ceara crêpe at 3s. 2d. per pound and plantation Para crêpe at 3s. 2d. per pound.

This latter sample was also satisfactory in composition. In both cases the amounts of resin and protein were not excessive for *Manihot* rubber, but the loss on washing was rather high.

RUBBER PLANTING IN THE MADRAS REGION OF INDIA.

The Madras Presidency at the present time is the most productive rubber region of British India. The area under rubber cultivation in that Presidency is 12,922 acres, and the number of *Hevea* trees is estimated at 1,636,476. The only other important rubber-producing regions of India are Assam, with 4,681 acres and 137,430 trees, and Burma, with 29,544 acres and 4,011,399 trees. The yield of the Assam plantations is relatively small, but is increasing steadily. The output of crude rubber in Madras in 1913 was more than double that of Burma, where most of the trees have not yet reached a tappable age. Practically all *Hevea* is "stump-planted," stumps being obtained from nursery trees from 9 to 12 months old. At the average rate of development of plantation *Hevea* in India, trees become tappable about four years from the date of stump-planting.

The American consul at Madras reports that in 1915 the United States purchased crude rubber for the first time from India direct, the quantity purchased amounting in value to \$110,035. The exports from the Madras Presidency to all countries showed in the fiscal year 1915-16 an expansion of 50 per cent in quantity, while the value increased 31 per cent. The average value declined from \$99 to \$88 per hundredweight. Shipments to the United Kingdom and Ceylon increased from \$1,675,090 to \$2,065,018, and from \$688,448 to \$937,612, respectively.

The following table shows the quantities and values of exports, with average price per pound, for the last four fiscal years:

Year.	Quantity in Pounds.	Total Value in U. S. Currency.	Value Per Pound in U. S. Currency.
1912-13	888,800	\$1,323,139	\$0.08
1913-14	1,595,900	1,989,101	0.07
1914-15	2,388,600	2,367,714	0.06
1915-16	3,559,300	3,113,262	0.05

RUBBER THEFTS IN THE FAR EAST.

Far Eastern exchanges contain many items relating to thefts of both crude rubber and latex. These thefts appear to be increasing each day, but this is not surprising when one considers the tremendous growth of the rubber-producing industry in that part of the world. In Malaya the records show that the courts are imposing exemplary punishment on rubber thieves, and it appears that the government is seeking to devise a system that will effectively check rubber stealing.

Mr. Pearson's book "What I Saw in the Tropics" will interest every rubber man who aspires to know more about crude rubber production. Price, \$3.

MAURITIUS RUBBER IMPORTS.

Mauritius, the prosperous little British island of the South Indian Ocean, has about 382,740 inhabitants, of which 261,093 are Indians, who make up the laboring element; the balance of the population being composed of Mauritian descendants of the former French and Dutch settlers, and Britishers. The sugar industry is the economic and commercial mainstay of the colony; other products are aloe fiber, manioc, maize, tea, vanilla, coffee, fruits, vegetables, etc.

Official statistics for 1915 show that, besides wearing apparel containing rubber, Mauritius imported \$54,723 of rubber articles, against \$42,442 the previous year.

HEVEA PLANTING IN THE FIJI ISLANDS.

The latest available official reports regarding the rubber plantation industry in the Fiji Islands are for the year 1914.

Rubber planting is still in an experimental stage there. *Hevea* trees from seedlings planted in 1906 at a distance of 17 by 17 feet had attained in 1914 an average girth of 17.1 inches at 3 feet from the ground. Thirty trees tapped about 170 days (in all 4,970 tappings) yielded 22½ pounds of smoked biscuits and 6½ pounds of scrap. Seedlings planted in 1908 attained a girth of 11.4 inches and stumps planted the same year a girth of 11.1 inches; in each case at a height of 3 feet from the ground. In most cases the plots had suffered much from storms.

RUBBER IN UGANDA.

The *Hevea* rubber crop was next in importance to coffee on plantations in Uganda during the fiscal year, 1915-16, according to a report recently published by the Department of Agriculture of the Government of that British colony.

The area under rubber plantation was divided up as follows: 1,072 acres over five years old and 328 acres under five years. In addition to this 4,506 acres over two years old and 238 acres below that age were interplanted with coffee, making a total of 6,144 acres under *Hevea* on regular plantations. Besides these plantation areas, it was estimated that the natives had 1,062 acres under *Hevea* and 2,273 acres under Ceara (*Manihot*) rubber; while the several religious missions had 169 acres of *Hevea* and 121 acres of other rubber.

A comparatively small area had reached the tapping stage, but the exports were rising gradually, being 52,349 pounds in 1915-16 compared with 22,056 pounds in the previous fiscal year.

The output suffered but little from pests and diseases, the small shipments of plantation rubber made realized good prices, so that it is conservative to state that rubber promises to become of considerable importance in the agricultural development of Uganda.

THE RUBBER TRADE IN MALAYA.

By Our Regular Correspondent.

ALL talk in local rubber circles is chiefly concerned with the projected "American invasion." As mentioned in previous articles, American capitalists are taking a lively interest in the Malayan rubber industry, an interest which promises to develop very speedily into active participation in production, and this on a very big scale. Matters have already progressed so far as to justify mention in the realms of government. Speaking at a recent meeting of the federal council of Malaya, Sir Arthur Young, G. C. M. G., who, besides being governor of the Straits Settlements, is the high commissioner of the Federated Malay States, said: "With reference to what has been termed the American invasion I understand that the large company in question do not wish to have land alienated to them. They have no desire to lead to over-production. They want to purchase land already alienated, and, first of all, they wish to find out whether the planters want them to come here or not. It is for the planters to say. There is no law to stop land being sold to Americans."

It is only natural that when the news of this large company's proposed activities became noised abroad among the planting community it had rather a mixed reception. The first impulse was to resent an apparent intrusion on what might be termed "our own preserves," but second thoughts led to a change of view, and now it can be said with confidence that the United States' entry into the great industry of Malaya will be generally welcomed by all in any way connected with it. It is recognized that the putting of capital into a country, while furthering the ends of the capitalists, cannot fail also to increase the prosperity of the country concerned. I have heard it said that planter antagonism to the American invasion is based on fear of "American methods," but this surely is a childish view to take. If, say others, the Americans have anything to teach us in the art of profitably administering our properties, let us learn it all as quickly as possible, for these be days when we need to get the best possible results from all of our possessions. If our methods are as good as any that can be imported, they are not likely to be disturbed, for the newcomers are hardly likely to want change just for the sake of change.

As regards the risk of over-production, if quantities of new capital are introduced, there is no need to tell anyone connected with the trade that the demand for rubber is increasing by such leaps and bounds that any such fears need not be entertained for a moment. It is even possible that there may come again a period of such scarcity as was experienced some ten years ago. There are now trades to which rubber is so essential, and that in vast quantities, that those who have sunk capital in such businesses, feel the necessity of taking a direct interest in the production of the raw material. For one thing in particular they are naturally anxious not to be entirely at the mercy of the market—and the market price—in the matter of supplies. The present time, too, is considered particularly opportune for coming in for the simple reason that the bulk of rubber plantation capital is held in Great Britain, and as the war goes on it will be increasingly difficult to find the money to develop the large number of estates, which are still in need of development. With new British capital for the industry diminishing, there should certainly be companies willing to sell their properties or give part share in them rather than see them run to weed.

On the British side it is asked: Is it desirable to let foreigners get a big hold on our plantations? In the ordinary way the answer would be no, but in a case where it is necessary to sell, then America is the place to which to look for good prices. In fact, in the present condition of world politics, it is the only place to look to, seeing that Germany does not count, and that other allied nations have no spare capital to invest in foreign ventures. Then, from the point of view of the general interest of the country itself, any development of the land is to be welcomed. There are thousands and thousands of acres of rich land awaiting development, and only outside assistance can make this possible as it is obvious that for years after war is over the burden of taxation will prevent a large volume of British capital being available for colonial purposes. It is not likely that in such circumstances Britain will run the risk of detriment to the territories under her care by raising obstacles to foreign capital. Without help the colonies will decline, but by accepting it both Great Britain and those who assist will benefit. From all points of view, then, the promised "American invasion" of Malaya is to be heartily welcomed.

Recent company reports indicate that, while practically all estates are showing steady and substantial profits, directors are being more cautious than ever in the matter of making large allocations to reserve. It is expected that war taxes on profits are to be made heavier still, and when the pressure of war conditions is becoming heavier every day, companies have to be prepared for almost any calls. As regards the thriving nature of the industry, nothing is more significant than the way in

which cocoanut companies are abandoning that product in favor of rubber. Only three or four years ago there was great talk of a boom in cocoanuts, a boom that was to outrival that in rubber of a few years previous. "The consols of the East" was one expressive phrase used to describe the new industry, and a good deal of money was put into cocoanut estates in various parts of the peninsula. But the boom has not eventuated. For some reason cocoanut cultivation does not prove a general success. Various causes hinder the development of estates, and speculators are finding that they will have to wait a long time for the big profits promised. So now rubber trees are replacing cocoanut trees in a good many cases.

ANOTHER VIEW OF THE AMERICAN INVASION.

ALL rubber men do not hold the opinion of the correspondent of THE INDIA RUBBER WORLD on this matter, however. Discussing the tendency of the "wise men of the West" to acquire land on British soil in Malaya—and plant rubber in competition with British planters already established there, our English contemporary "Tropical Life" states the drawbacks of such a tendency from the point of view of many British planters.

Firstly, it would further increase the output of raw rubber by outsiders, who cannot do so well elsewhere, when we British planters are already threatened with a surplus in the near future as it is. Secondly, as the manufacturers are at the back of the move, they can only be after producing their own supplies, or a portion of them, thereby reducing their competition for our output.

Regarding the viewpoint of the American manufacturer who is striving to protect himself from the raids in the form of rubber booms made upon his legitimate business, our English contemporary continues:

But how is the American manufacturer proposing to protect his interests? Is it not at the expense of our own by coming to British Malaya to plant rubber against our own planters after having watched them all these years risking and losing money, health and even lives in establishing the industry and showing how it can be carried on with safety to pocket and person.

Lastly, but most important of all, there is the question of native labor supplies. From what source will the Americans draw their requirements; from British India and elsewhere within our Empire, when the great question of the day is to know how the British-owned estates, sugar, cacao, etc., will do five or ten years hence, when India keeps her labor to herself and our own areas have been largely increased as they must be if the world is not to run short?

We have no feelings but those of good will towards our American cousins, so long as they are not hyphenated ones; but knowing as we do what a large proportion of German blood there is in the so-called American hustlers now overflowing into the world, South America, British territory and elsewhere, we feel, therefore, before we set up and allow outsiders to grow fat at our expense, now we have proved that they can do so, that we ought first to consider what harm can befall our planters by doing so; and secondly, and above all, let us analyze the constitution of the companies and of the syndicates that are proposing to invade and exploit British Malaya at our cost. The wisdom of allowing genuine Anglo-Saxon Americans to settle in Malaya is doubtful, but it would be worse than wicked to feed Germany and Austria through the United States, as we may do by such an action. Even from the competitive point of view it would be bad to take the backbone out of the New York orders by allowing American manufacturers to settle in British territory to produce a portion of their supplies; but if, hidden behind the cosmopolitan back of Uncle Sam, we must feed Germany and Austria as well and spoil their future demand for our plantation rubber also, it would not only be wicked, but downright suicidal for British interests won at so much cost to British subjects.

As already said, we have nothing but good will towards the genuine inhabitants of the United States, who, we know, are well disposed towards us. Even in their case, however, we believe in the saying that "Charity begins at home," and as America is so extremely wealthy, Uncle Sam can well afford to continue to buy our rubber, as he has been doing, instead of coming in to produce rubber to reduce his competition as a buyer in the world's markets.

FIGHTING THE LEAF DISEASE IN DUTCH GUIANA.

IN his report on the South American leaf disease (as briefed in THE INDIA RUBBER WORLD, September 1, 1916, page 689), Mr. Bancroft recommends spraying with a solution of sulphate of copper in lime water. He also advocates the destruction, by burying or burning, of all fallen leaves.

A preliminary report of Dr. G. Stahel, Government Mycologist of Dutch Guiana, has been made which takes a somewhat dissimilar view of the efficacy of spraying, and recommends radically different treatment for eradicating the disease.

Dr. Stahel has completed his investigations, but the Board of Agriculture is delaying the full report until drawings and photographs, which are to be reproduced in Holland, are available. However, the preliminary report has been published in order that practical work may not be further delayed. This report is as follows:

The disease is attributable to a fungus of three fructifications. The main fructification, *i. e.*, the perithicium, is found on the old leaves, in one to two months at its earliest and before they are matured.

The pycnidium fructifications are always observable on the matured leaves; after two months the perithicium always predominates and is always to be found on the leaves.

The scoliotrichum conidium buds in water in about two hours; if sowed on young leaves, it will be found that after ten hours, a large percentage of the germ-tubes collect under the cuticle, and after 20 hours they will penetrate between the epidermis cells into the leaves and branches.

Drying the conidium, they will die out after 15 hours. The pycnosporous bud in water and in nourishing solution, after a few hours, but the general germ-cell does not exceed two to three micron in length.

Sowed on very young leaves, the germ-cell will not develop further.

The ascospores bud in about the same period as the scoliotrichum-conidium sowed on young leaves. It will be found under the cuticle after 12 hours, very few, single and short germ cells, but after 20 to 22 hours these germ cells will be found far thinner than the scoliotrichum, although grown a little further under the cuticle, but not penetrated in the leaves between the epidermis cell; if the spores are dried out they die in a few hours. The production, however, of ascospores is further very limited, even when the leaves are well supplied with much perithicia, but few on some of the trees that I could obtain for my investigation.

The ascospores will, therefore, contribute very little in spreading the disease. The matured leaves, which so far only bear perithicia are consequently not very dangerous.

It is, however, with the young and matured leaves quite different; these produce a large quantity of scolico. We have found in *Hevea* fields trees that were withering during the whole year, or trees which were forming young sprouts invested with scoliotrichum fructifications. In view of these facts we have come to the following conclusions:

Care should be taken during three to four weeks that the cultivations be kept free from all young *Hevea* leaves, and it will be found that all scoliotrichum fructifications will disappear and also the conidium within 24 hours. The scoliotrichum fructifications will appear again, however, at a later period, and will spread, if the ascospores be not effectively made harmless. It will be necessary, therefore, from time to time to repeat the treatment; but experience will teach in the interval between each treatment.

It is obvious in these treatments that the neighboring plantations follow suit, or in the event of unwillingness on the part of the neighbors to do so the *Hevea* trees should then be removed from the fields.

As the leaves of the *Hevea* always form in a cluster from, say, eight to ten, close upon each other, at the end of the branches, they can be cut off very easily with the aid of a cocoa knife, which is to be highly recommended.

For instance, during the dry season, when the latex is not flowing sufficiently, the laborers can be divided for a few weeks and put to work in the *Hevea* fields to destroy all the young leaves, especially at certain times, when only small portions of the trees are wintering or producing new sprouts. A laborer can treat two large or three small ones in a day of eight hours.

Whether this mode of fighting the disease in Dutch Guiana will prove effectual if continued is hard to say, or whether it

would be better to substitute the *Hevea* in the coffee fields by coffeemama trees I refrain from discussing.

Until recently I have overvalued the significance of ascospores for spreading the disease; only by the latest investigations during the last two months it has proven to me that the infective power of the ascospores can be insignificant, and only in view of these results could I recommend a method which, to my idea, will prove technically adequate.

A few weeks back an article appeared in one of the local papers to the effect that in British Guiana something had been effected towards the eradicating of the disease, and in consequence I am obliged to mention something in connection with the system employed in that colony.

It is recommended by the Government botanist in that colony that spraying the young leaves with Bordeaux mixture and cutting off the dried branches from the healthy parts and destroying the fallen leaves will be found to help remove the disease; to this I will say dead fungus does not do any harm. But the cutting of the dry branches from the healthy part is based on the fact of my investigation and which I cannot even recommend. I have, therefore, advised a few plantation owners where the system has been carried on not to continue it; the reason of this will appear in the Bulletin.

Spraying of the trees with Bordeaux mixture will, when applied on leaves two to four days old prove favorable, but the application appears to me for various reasons to be unfit; in the first place, it is expensive and not so beneficial as my proposed method.

Proofs are also shown here that the young leaves of one to three centimeters cannot bear the spraying with Bordeaux mixture, and will curl and fall off. This fact has also been proved on the Sloopwijk plantation during the fighting experiments.

It will thus be seen that these two investigators are widely at variance regarding the methods necessary to overcome this disease. However, we understand that Mr. Bancroft has not yet completed his investigation, and moreover, has since made a visit to Dr. Stahel to consult with him regarding this important matter. It is hoped that as a result of this meeting conclusions will be reached which will be of such character as to provide rubber growers throughout the world with a remedy for this formidable disease.

CRUDE RUBBER IN HONDURAS.

According to the American Consul at Ceiba, Honduras, the crude rubber industry there is dormant. The low prices prevailing in rubber markets, coupled with the export duty levied by the Government of Honduras and the municipalities, amounting at Cuba to approximately 4 cents gold per pound, makes rubber gathering so unprofitable that the natives will not tap the trees even when they can find them close at hand, and traders declare that they buy the product merely as an accommodation.

RUBBER TRADE OF BOLIVIA IN 1915.

According to the statement of the Bolivian Minister of Finance to the 1916 National Congress of Bolivia, the exports of crude rubber, which amounted to 4,484,915 kilograms [9,867,813 pounds] in 1914, reached 5,034,847 kilograms [11,120,663 pounds] during the fiscal year 1915-16.

RUBBER GOODS IMPORTS INTO VENEZUELA.

The American Consul at Maracaibo reports the following imports of rubber manufactures into Venezuela during the years 1914 and 1915:

From—	Tires.		All other rubber goods.	
	1914.	1915.	1914.	1915.
United States	\$1,720	\$5,600	\$1,320	\$3,152
United Kingdom .....	.....	.....	490	1,200
Germany .....	.....	.....	1,960	.....
All countries	\$1,720	\$5,600	\$3,770	\$4,352

CONSULAR INVOICES FOR BRAZILIAN SHIPMENT.

The Brazilian budget law for 1917 provides that no invoices after shipment will be accepted by Brazilian consuls, and shipments unaccompanied by consular invoice pay double duty.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED DECEMBER 19, 1916.

- N**O. 1,208,772. Heelless overshoe. C. S. Goodyear, Naugatuck, assignor to The L. Candee & Co., New Haven—both in Connecticut.
- 1,208,869. Rubber-coated closet seat. M. J. Whelan, Muskegon, Mich., assignor to Brunswick-Balke-Collender Co., a corporation of Delaware.
- 1,208,902. Elastic tire. H. E. Boyd, Akron, Ohio.
- 1,208,906. Inner tube for pneumatic tires. J. P. Brophy, Birmingham, Ala.
- 1,208,922. Drenching bottle entirely constructed of rubber. G. Dawkins, Truxno, La.
- 1,208,932. Demountable rim. R. A. Eckberg, Des Moines, Iowa.
- 1,208,946. Tire filler. L. G. Gilchrist, Vandergrift, Pa.
- 1,208,948. Spring tire with rubber shoe. G. Greco, Pittsburgh, Pa.
- 1,209,042. Pneumatic tire. A. J. Savage, San Diego, Calif.
- 1,209,130. Tire protector. A. Dahl, Yardley, Pa.
- 1,209,206. Vulcanizing fuse. L. Risk, Minneapolis, Minn.
- 1,209,223. Diving dress. H. Stelzner, assignor to the firm of Drägerwerk, Heinh. & Bernh. Dräger—both of Lübeck, Germany.
- 1,209,224. Diving helmet. H. Stelzner, assignor to the firm of Drägerwerk, Heinh. & Bernh. Dräger—both in Lübeck, Germany.
- 1,209,374. Hose coupling. A. Andreoli, Meadow Lands, Pa.
- 1,209,401. Garter pocket. E. V. Crouse, Chicago, Ill.
- 1,209,442. Doubletread tire. J. F. Jablonski, Irvington, N. J.
- 1,209,509. Demountable rim. F. Spranger and N. M. Spranger, assignors to Spranger Rim and Wheel Co.—all of Detroit, Mich.
- 1,209,516. Rubber tooth brush. C. H. Thompson, assignor of one-half to F. H. Wager—both of Troy, N. Y.
- 1,209,573. Cushion tire. N. H. Hassel, Beverly Hills, Calif.
- 1,209,605. Bead for tire casings. T. J. Mell, assignor to the Republic Rubber Co.—both of Youngstown, Ohio.
- 1,209,645. Cord tire. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.

ISSUED DECEMBER 26, 1916.

- 1,209,656. Commode protector comprising an integral rubber ring. S. F. Bailey, North Warren, Pa.
- 1,209,660. Overshoe with elastic cushion at the heel. L. A. Baum, Newark, N. J.
- 1,209,715. Rubber tire and its attachment to wheels. E. B. Killen, London, England.
- 1,209,726. Recoil pad. P. J. Krueger, Blue Island, Ill.
- 1,209,740. Piston packing. C. I. E. Mastin, Midland Park, N. J.
- 1,209,763. Bath mitten. C. A. Rosengren, assignor to The Goodyear's Metallic Rubber Shoe Co.—both of Naugatuck, Conn.
- 1,209,771. Combined sleeping bag and knapsack. R. Skancke, Christiania, and J. F. Aasnes, Selvig, in Sande, Norway.
- 1,209,856. Automobile tire. W. F. Lahey, East Hartford, Conn., assignor of one-third to A. H. Miller, Holyoke, Mass.
- 1,209,978. Self-filling fountain pen. D. J. La France, Somerville, assignor to C. Brandt, Boston—both in Massachusetts.
- 1,209,986. Rubberized sheet for trunk panels and the like. C. D. Mason, assignor to The Goodyear's Metallic Rubber Shoe Co.—both of Naugatuck, Conn.
- 1,210,048. Non-skid pneumatic tire. H. Z. Cobb, Winchester, Mass., assignor to Revere Rubber Co., Providence, R. I.
- 1,210,132. Non-skid tire. I. E. Ash, Athens, Ohio.
- 1,210,155. Tire reliner. J. L. G. Dykes, Chicago, Ill.
- 1,210,219. Sectional tire having inflatable inner segmental tubes. G. Sheely and J. H. Sheely, Marshalltown, Iowa.
- 1,210,273. Packing and method of making same. R. T. Campbell, Kansas City, Mo.
- 1,210,327. Filler for tire casings comprising a mass of horsehair infiltrated with a solution of soft rubber and drained and dried. G. Kelly, Hinsdale, Ill.

ISSUED JANUARY 2, 1917.

- 1,210,466. Petticoat waistband with elastic sections. L. Gutman and B. Gutman, New York City.
- 1,210,538. Air gage for tires. E. B. Rose, Minneapolis, Minn.
- 1,210,575. Joint packing strip. J. F. White, assignor to L. E. White—both of Chicago, Ill.
- 1,210,594. Armor for automobile tires. R. J. Brooks and F. E. Martin, Malvern, Ark.
- 1,210,702. Dust cap for tire valves. A. C. Savage, Indianapolis, Ind.
- 1,210,883. Pasteboard dispensing package for elastic tape. H. A. Austin, assignor to Everlystik, Inc.—both of Boston, Mass.
- 1,210,933. Tread for resilient tires. B. C. Hamm, Boston, Mass.
- 1,210,939. Respirating device. M. Hilgers, Tazewell County, Ill.
- 1,211,005. Tire or casing spreading tool. J. B. Stroud, Pass Christian, Miss.
- 1,211,035. Pneumatic cord tire. C. L. Archer, Minneapolis, Minn.
- 1,211,042. Pneumatic life saving suit. G. Balogh, Detroit, Mich.

- 1,211,055. Elastic arch and ankle support. H. A. Bernstein, New York City.
- 1,211,056. Tire rim. J. M. Berry, Detroit, Mich.
- 1,211,067. Canvas hose couplings. N. B. Braly, Butte, Mont.
- 1,211,192. Tire protector. W. C. Logan, Louisville, Ga.
- 1,211,214. Tire protector. A. W. Neff, Powell, Ohio, assignor of one-half to G. W. Neff, New York City.
- 1,211,225. Bath brush. A. Pludowski, assignor of one-third to S. Orlowski and one-third to W. Szczepaniak—all of Waterbury, Conn.
- 1,211,245. Valve for pneumatic tires. O. Schutz, New York City.
- 1,211,246. Vaginal syringe. N. C. E. Schwartz, Chicago, Ill.
- 1,211,369. Toy balloon. T. W. Miller, assignor to The Faultless Rubber Co.—both of Ashland, Ohio.

ISSUED JANUARY 9, 1917.

- 1,211,387. Device for connecting air hose to pneumatic tire valves. C. W. Beck, Rockville Center, N. Y., assignor to Beck-Frost Corporation, Detroit, Mich.
- 1,211,427. Tire patch. H. B. Ferguson and I. G. Ferguson, Newburgh, N. Y.
- 1,211,466. Air brake hose clamp. C. A. McKeranahan, assignor to The Westinghouse Air Brake Co.—both of Wilmerding, Pa.
- 1,211,501. Tire valve. J. W. Taylor, assignor of two-thirds to G. A. Mohr—both of Lansing, Mich.
- 1,211,619. Anti-skid or anti-slip shoe tread. A. J. Oehring, assignor of one-half to A. L. Tucker—both of Chicago, Ill.
- 1,211,642. Automobile top repair patch. H. C. Thompson, assignor to The Hall-Thompson Co.—both of Hartford, Conn.
- 1,211,662. Tire rim tool. R. A. Best, assignor of one-half to G. M. Fish—both of Grand Rapids, Mich.
- 1,211,663. Tire rim tool. R. A. Best, Grand Rapids, Mich.
- 1,211,666. Truss pad of rubber. W. T. Bobo, assignor to The Easy Truss Co.—both of Battle Creek, Mich.
- 1,211,699. Nursing vest. V. Guinzburg, assignor to I. B. Kleinert Rubber Co.—both of New York City.
- 1,211,706. Blanket for offset printing presses and method of making the same. B. W. Hoerbelt, Buffalo, N. Y.
- 1,211,769. Tire valve. M. C. Schweinert, West Hoboken, N. J., and H. P. Kraft, Brooklyn, N. Y.
- 1,211,806. Cushioned heel pad for boots and shoes. J. A. Adams, Toronto, Ontario, assignor to E. A. Adams, Montreal, Quebec—both in Canada.
- 1,211,846. Pneumatic bed for hide and leather working machines. H. A. Holder, Lynn, assignor to Holder-Perkins Co., Woburn—both in Massachusetts.
- 1,211,867. Tire patch and the process of making the same. J. G. Moomy, Erie, Pa.
- 1,211,869. Resilient tire. H. A. Naylor, Valparaiso, Chile.
- 1,211,885. Resilient wheel. B. C. Seaton, Nashville, Tenn.
- 1,211,928. Colon-irrigator. A. R. Fisher, New York City.
- 1,211,958. Pneumatic tire shoe. M. C. Overman, New York City.
- 1,212,077. Life preserver. J. W. Lewis, assignor of one-fourth to T. L. Lee—both of Boley, Okla.
- 1,212,084. Cushion tire. E. Melford, assignor of one-fifth to R. W. Cain—both of Denver, Colo.

ISSUED JANUARY 16, 1917.

- 1,212,297. Fountain-pen. W. A. Welty, Waterloo, Iowa.
- 1,212,313. Brush set in rubber. T. F. Barry, assignor to Rubber & Celluloid Harness Trimming Co.—both of Newark, N. J.
- 1,212,315. Life belt consisting of an endless air tube and casing. S. P. Bjerre, Chicago, Ill.
- 1,212,379. Quick-acting retainer for demountable rims. C. B. Michel, Oilfields, Calif.
- 1,212,448. Tire guard. O. H. Brown, Ariel, Pa.
- 1,212,558. Automobile tire armor. G. Riddle, Riddle, Idaho.
- 1,212,640. Tire valve. E. A. Hilding, assignor to Aktiebolaget Svenska Luftventiler—both of Lidköping, Sweden.
- 1,212,641. Tire valve. E. A. Hilding, assignor to Aktiebolaget Svenska Luftventiler—both of Lidköping, Sweden.
- 1,212,677. Combined brassiere and girdle. B. Prince and H. Prince, New York City.
- 1,212,744. Fountain-pen. S. S. Crocker, Wollaston, Mass.
- 1,212,819. Nipple. F. S. Sakanai, San Francisco, Calif.
- 1,212,834. Sporting shoe having a removable one-piece rubber outer sole.
- 1,212,973. Vehicle tire. W. T. Lupton, and J. Mca. Lupton, Martinsburg, W. Va., and J. W. Jolliffe, Clear Brook, Va.
- 1,212,985. Shoe sole comprising a cut piled fabric and a rubber compound filling. L. F. Montgomery, Fort Recovery, Ohio.
- 1,213,005. Obstetrical instrument comprising an inflatable pad. A. H. Pillsbury, assignor of one-half to V. Czeskleba—both of Lyndon Station, Wis.
- 1,213,072. Tire armor. C. Campbell, Yonkers, N. Y.
- 1,213,096. Armored pneumatic tire. B. Granville, New York City.

Chemical Patents will be found on page 266. Machinery and Process Patents on pages 270-271.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

In order to give the public the advantage of having abridgements of specifications up to date while retaining their numerical sequence, applications for patents made subsequent to 1915 are given new numbers when their complete specifications are accepted, or become open to public inspection before acceptance. The new numbers start with No. 100,001 (without any indication of date), and supersede the original application numbers in all proceedings after acceptance of the complete specifications.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, DECEMBER 6, 1916.]

- 11,879 (1915). India rubber springs. F. Spencer, 77 Canon street, London.
- 11,920 (1915). Tread band for wheel tires. H. W. Barrett, 33 Livingstone Road, Gillingham, Kent.
- 11,931 (1915). Air tube for wheel tires. H. Brown, The Red House, Parkside, Wimbledon Common, Surrey.
- 11,966 (1915). Bed sore pad consisting of two layers of canvas, netting, etc., with hollow rubber balls between. A. F. E. de St. Dalmas, Tacotena, Lansdown Road, Sidcup, Kent.
- 101,734. Rubber block tire. E. W. Shaw, Oroya Links, Limited, Kalgoolie, Western Australia.
- 101,746. Egg-testing tray employing a perforated rubber covering. J. W. Perry, of McDowell & Co., Strand Road, Londonderry, Ireland.
- 101,772. A device for cleaning and polishing metal comprising a composition block of rubber, emery and carborundum. E. B. Openshaw, 5 St. George's Crescent, Eccles Old Road, Pendleton, Manchester.
- 101,795. Tire attaching means comprising soft rubber facing for tire and metal rim. F. Kuhne, 2 Bautznerstrasse, Dresden, Germany.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, DECEMBER 13, 1916.]

- 12,083 (1915). Rim attachment for solid rubber tires. D. Weisenacker, 10 Schildeckstrasse, and F. Cremer, 6 Schildeckstrasse—both in Fulda, Germany.
- 12,087 (1915). Rubber cap to fit over the muzzles of fire-arms to exclude moisture. C. Liddiard, 27 Somerset Road, Frome, Somersetshire.
- 12,180 (1915). Bed rest composed in part of rubber. Meinecke & Co., 66 Park Place, New York City. Assignees of C. W. Meinecke, East Orange, N. J., and D. Hogan, 48 Park Place, New York City—all in U. S. A.
- 12,182 (1915). Gloves with rubber finger tips. P. S. G. Dubash, 135 Highbury New Park, London.
- 12,241 (1915). Tire rim. F. W. Baker, 59 Hagley Road, Stourbridge.
- 12,284 (1915). Waterproof cover for ladies' hats. M. A. F. Haley, 39 Elizabeth street, Park Road, Little Horton, Bradford, Yorkshire.
- 12,300 (1915). Tire rim. A. J. Seex, 110 Long Acre, London.
- 101,821. Tire tool. H. J. Fussell, 16 High street, Midsomer Norton, Somerset.
- 12,317 (1915). Strips, blocks, or studs for tires molded from powdered cork combined with rubber. G. C. Twining, St. Mary's, Derby Road, Bournemouth.
- 12,367 (1915). Dental matrix or core with rubber suction disk. Dental Manufacturing Co., and H. A. Edwards, Alston House, Newman street, London.
- 12,380 (1915). Tread band for wheel tires. W. C. Taylor, 2 Stanley Road, West Bridgeford, Nottingham.
- 12,420 (1915). Watch wristlet comprising a receptacle of rubberized material and a ring of rubber. L. E. F. Wachter, 4 East 28th street, New York, U. S. A.
- 12,464 (1915). Combination cushion and pneumatic tire. A. A. Crozier, 3 Woodquest avenue, Herne Hill, London.
- 12,469 (1915). Combination pneumatic and cushion tire with sponge rubber filler. A. A. Crozier, 3 Woodquest avenue, Herne Hill, London.
- 12,539 (1915). Rubber proofed fabrics for aviators' garments. F. J. Caunter, and G. S. Coster, 116 Fore street, London.
- 101,878. Rubber bath mat. E. L. Livingston, West Orange, New Jersey, U. S. A.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, DECEMBER 29, 1916.]

- 12,663 (1915). Method of attaching rubber heel pads to shoes. J. A. H. Drew, 137 Gertrude street, Fitzroy, and H. J. Drew, 4 Reid street, North Fitzroy—both in Victoria, Australia.
- 12,737 (1915). Cushion tire. A. Broussois, 99 Avenue des Ternes, Paris.
- 12,818 (1915). Shoe sole having a rubber tread joined to a leather shank. E. C. R. Marks, 57 Lincoln's Inn Fields, London.
- 12,850 (1915). Pneumatic horse collars. O. F. Horley, West Lands, New Osgoode, Saskatchewan, Canada.
- 12,858 (1915). Sectional pneumatic tires. A. Pancera, 31 Via XX Settembre, Genoa, Italy.
- 12,874 (1915). Inner tubes. A. E. Henderson, 503 Kent Building, Toronto, Ontario, Canada.
- 101,895. Reservoir pens. C. Bristow, The Chestnuts, Brockley View, Forest Hill, London.
- 101,905. Golf and like balls. P. A. Martin, Martin's Limited, Granville street, and J. Stanley, 70 Ivor Road, Sparkhill—both in Birmingham.
- 101,906. Football bladder. W. W. Moren, 129 Yorkshire street, Oldham, Lancashire.
- 101,914. Electric cables. T. O. Callender, and Callender's Cable & Construction Co., Hamilton House, Victoria Embankment, London.

- 101,941. Drying apparatus. B. S. Harrison, 1133 Broadway, Manhattan, New York, U. S. A.
- 101,942. Vehicle wheels comprising a rubber annulus. F. Partington, 49 Pool Road, Victoria Park, Smethwick, Birmingham.
- 101,945. Inner flexible lining of a milking machine teat cup. J. Treloar, Victoria street, Hamilton, New Zealand.
- 101,949. Detachable rim. G. P. Robertson, Riverside, Avondale, Auckland, New Zealand.
- 101,955. Golf ball. P. M. Justice, 55 Chancery Lane, London.

THE FRENCH REPUBLIC.

PATENTS ISSUED (WITH DATES OF APPLICATION).

- 480,993 (June 1, 1915). Elastic tire for cycles and other vehicles. H. Cognet.
- 480,999 (February 18, 1916). Cellular tire. J. Milne and J. J. Lapham.
- 481,000 (February 19, 1916). Mud splash guard for motor vehicles and others. W. J. Sherrington.
- 481,005 (February 19, 1916). Armored tires for vehicle wheels. H. M. Hillman and J. Schwab.
- 481,008 (February 19, 1916). Improvements in pneumatic tires. F. S. Dickinson.
- 481,017 (February 22, 1916). Improvements in tires for vehicle wheels. J. S. Juarez.
- 481,036 (February 22, 1916). Pneumatic wheel. J. Greppi and A. Romanach.
- 481,080 (February 29, 1916). Improvements in pneumatic tires. L. R. Poschadel.
- 481,086 (February 29, 1916). Elastic wheel. J. C. Streibich.
- 481,097 (March 1, 1916). Elastic wheel. A. D. Wack.
- 481,101 (March 1, 1916). Detachable disk-wheel. Société Française des Roues Amovibles.
- 481,122 (March 4, 1916). Rubber heel. J. M. Van Heusen.

TRADE-MARKS.

THE UNITED STATES.

- 96,315. Representation of a pneumatic tire, the words 95% AIR, 5% PLUGGER, NOT A FILLER, PUNCTURE PLUGGER, BALES, 5% PUNCTURE PLUGGER, 100% TIRE EFFICIENCY, and in the center a portrait of E. L. Bales, president of the corporation—puncture pluggers for tires. Bales Puncture Plugger Co., Indianapolis, Ind.
- 98,017. The word TYFOLITH—overlays, sheet-rubber, and rubber fabric. The Typolith Co., Battle Creek, Mich.
- 96,038. The word PASTIME—boots and shoes of rubber, etc. United States Rubber Co., New Brunswick, N. J., and New York City.
- 97,451. The words RELIANCE DE LUXE—druggists' sundries. The Faultless Rubber Co., Ashland, Ohio.
- 98,452. The words RHINOS—rubber tires. H. B. Wallace, St. Louis, Mo.
- 98,684. The words RIE NIE—rubber paint for renewing tires, etc. Durkee-Atwood Co., Minneapolis, Minn.
- 98,854. The word PARAGON—automobile and bicycle tires of rubber and fabric. Ajax Rubber Co., Inc., Millbrook, N. Y.
- 99,166. The word JUMBO—rubber tires or tire casings of rubber with suitable strengthening material and inner tubes for pneumatic tires. The General Tire & Rubber Co., Akron, Ohio.
- 99,170. The words THE FIRST NATIONAL STORES—elastic webs and elastic rubber webs, etc. A. M. Malouf, Salt Lake City, Utah.
- 99,349. The figures and letter 62-B—battery-jars. India Rubber Co., New Brunswick, N. J., and New York City.
- 99,425. A floral design—boots and shoes of rubber, etc. T. G. Plant Co., Boston, Mass.
- 90,642. The word HIKLAS—rubber belting, hose, packing and tires. The Wirthlin-Mann Co., Cincinnati, Ohio.
- 93,841. A monogram composed of the letters H. M. R. Co.—rubber belting, etc. Hudson Mechanical Rubber Co., New York City.
- 96,309. The words TRIPLE DIAMOND—machinery belting composed of rubber and fabric. New York Belting and Packing Co., New York City.
- 96,310. A diamond-shaped design in triplicate—machinery belting composed of rubber and fabric. New York Belting & Packing Co., New York City.
- 97,014. The word SAFETY—conducting hose composed of rubber and fabric. Fabric Fire Hose Co., New York City.
- 97,401. The words YELLOW JACKET—suspenders. The Gluckauf Co., Inc., New York City.
- 97,676. A representation of a golf-ball with a black square in the center and all around diamond designs—golf-balls. The Worthington Ball Co., Elyria, Ohio.
- 99,104. A representation of a golf-ball composed of squares, in the center of the ball a black oblong mark—golf-balls. J. Wanamaker, New York City.
- 99,105. A representation of a golf-ball composed of squares, and in the center three oblong marks—golf-balls. J. Wanamaker, New York City.
- 99,195. The word UNISTAR—friction tape. The Mechanical Rubber Co., New York City, Chicago, Ill., and Cleveland, Ohio.
- 99,291. The word RESISTON—hard rubber compound for electrical purposes. American Hard Rubber Co., New York City.
- 92,969. The word CELLO—hot water bottles. A. S. Campbell Co., Boston, Mass.
- 98,664. The word PEARL-ZODIAC—golf balls. Martins Birmingham, Limited, Birmingham, England.
- 99,674. The word RIVAL—boots and shoes having fabric uppers and rubber soles attached thereto by vulcanization. Boston Rubber Shoe Co., Boston and Malden, Mass.

- 95,627. A green oval-shaped device—rubber boots and shoes. Lambertville Rubber Co., Lambertville, N. J.
- 99,740. A design with the words *TOP NORCH* therein and the words *BEACON FALLS* above—rubber boots, shoes, overshoes, etc. The Beacon Falls Rubber Shoe Co., Beacon Falls, Conn.
- 374,351. The word *VULMET*—polishing material for dentists' use on vulcanite dentures and metal dentures. Claudius Ash, Sons & Co., Limited, London, W.
- 374,628. The word *QUASCO*—articles of clothing. Philip Michael Cohen, trading as Cohen & Wilks, Cheetham, Manchester.
- 375,222. The word *LIMPETTE*—packing and jointing in the nature of packing. J. W. Roberts, Limited, Midlands Works, Armley, Leeds.
- 375,510. The word *PATHAN*—steam and hydraulic packings. Robert Beldam, Limited, London, E. C.
- 371,697. A trapper inside a ring bearing the words "THE CANADIAN RUBBER CO., LIMITED, MONTREAL"—goods manufactured from rubber and gutta percha. The Canadian Rubber Co., Limited, Montreal, Canada.
- 373,219. The word *HIGHTENSITE*—special insulating material in which india rubber predominates. Park Royal Engineering Works, Park Royal, London, N. W.
- 374,001. A Scotch clansman, and a Highland landscape enclosed in a circular frame with the word "ECONOMIC" striped across the whole—teapot spouts, connections for flexible tubing, protectors and sponges—all being rubber goods. N. Ross McLaren & Co., Bradford, Yorkshire.
- 374,111. A shield bearing a large letter *F*, surmounted by the word *FAULTLESS*—goods manufactured of rubber and gutta percha. The Faultless Rubber Co., Ashland, Ohio, U. S. A.
- 374,652. The word *STAPALITE*—goods manufactured of rubber and gutta percha. The Beldam Tire Co., Limited, Brentford, Middlesex.
- 375,402. An inverted letter *Y* inside of a letter *O* of larger font—rubber goods. Jno. Birch & Co., Limited, London Wall, London, E. C.
- 375,506. The word *GALITE*—goods manufactured of rubber. The Galite & Rubber Manufacturing Co., Limited, Hammersmith, London, W.
- 375,600. Head of Pericles with the words *PERICLES, PRINCE OF TYRE, SHAKESPEARE*—rubber tires. The Dunlop Rubber Co., Limited, London, E. C.
- 377,116. The word *NIBO*—balata soles for boots and shoes. Norman Isherwood & Co., Bolton, Lancs.
- 377,425. The word *BUCKSNER*—tobacco pouches of rubber. Robert Ernest Wright, London, E. C.
- 371,625. A moose head above the words *THE MERCHANTS RUBBER CO., LIMITED*—goods manufactured from rubber and gutta percha. The Merchants Rubber Co., Limited, Berlin, Ontario, Canada.
- 371,626. Crossed snow-shoes and a shield bearing the words *GRANBY RUBBER CO.*—goods manufactured from rubber and gutta percha. The Granby Rubber Co., Limited, Granby, Quebec, Canada.
- 373,416. A seal bearing a Scottish lion and the words *NORTH BRITISH RUBBER CO.*—rubber bands and rubber ink and pencil erasers. The North British Rubber Co., Limited, Edinburgh.
- 373,763. Two superimposed, intersecting triangles enclosing the letters *SA*—rubber toys, Aktieselskabet de forenede Gummi and Lufttringe Fabrikker Schionning and Avre, Copenhagen, Denmark.
- 374,104. A rectangle enclosing the words *INVINCIBLE NORTH BRITISH RUBBER CO., LIMITED*—hair combs. The North British Rubber Co., Limited, Edinburgh.
- 375,188. The word *SUNSITE*—packing and jointing. J. W. Roberts, Limited, Leeds, Yorkshire.

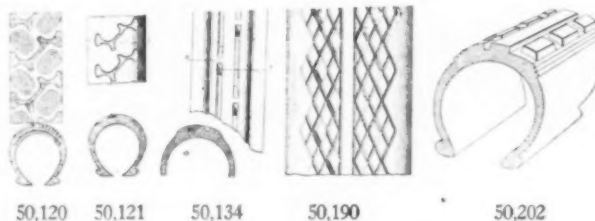
THE FRENCH REPUBLIC.

204. An oak leaf enclosed in a circular frame bearing the words *MARQUE DE FABRIQUE DÉPOSÉE*—rubber goods, including tobacco pouches, etc. François Marie Feraud Burrus, Blamont.
205. The word *BURRUS*—Same.
206. The word *OMNIA*—Same.
- 1,389. The word *CAZE*—tobacco pouches. Caze, Saint-Claude, Jura.
- 10,077. The word *MAGIC* on a background of cable-net. Stanislas Gounon, 16 Rue de la République, Lyon.
- 10,008. The word *STAN* on a cable-net background enclosed in a circular frame.—Same.
- 17,242. Picture of the French "War Cross" with the words *CROIX DE GUERRE-MARQUES DÉPOSÉE*—rubber goods of all kinds. Ferdinand Guiraud, 10 Rue des Minimes, Marseille.
- 24,282. The word *TITANINE*—varnish for aeroplane wings and for proofing fabrics. The British Aeroplane Varnish Co., Limited, Newcastle-on-Tyne.
- 163,161. The word *CUIRASSE*—special protector for pneumatic tires. Société Française des Pneumatiques Dunlop, 4 Rue du Colonel Moll, Paris.
- 163,162. The words *CUIRASSE DUNLOP*—Same.
- 163,222. The word *LE CROLEUM*—rubber goods. Alfred Nortier, 43 Rue de la Folie Méricourt, Paris.
- 163,544. The words *MARQUE DÉPOSÉE UNION* on a label—rubber goods, including footwear, garments, etc. Léon Eghiasaroff, 22 Rue Theodore de Banville, Paris.
- 163,549. The words *JUSQU'AU BOUT*—rubber goods. Jean Robellet, 14 Rue de Moscou, Paris.
- 163,550. The word *PÉPÈRE*—Same.
- 163,898. An artistic label with the name *LUXIA*—rubber goods. Société Camis & Cie, 59 Boulevard de Strasbourg, Paris.
- 164,076. The word *ANHYDROL*—chemical for proofing fabrics. Pierre Aubert, 58 Rue des Dames, Paris.
- 164,077. The word *LANGLEINE*—Same.
- 164,078. The word *ANHYDRINE*—Same.
- 164,159. The word "BARALONG"—reclaimed rubber. Charles Delhomel, 2 Rue Buffault, Paris.

DESIGNS FOR TIRES.

THE UNITED STATES.

- 50,120. Vehicle tire. Term 14 years. Patented January 2, 1917. W. B. Buckley, New York City.
- 50,121. Vehicle tire. Term 14 years. Patented January 2, 1917. W. B. Buckley, New York City.
- 50,134. Vehicle tire. Term 14 years. Patented January 2, 1917. R. H. Keaton, San Francisco, Calif.



- 50,190. Tire-tread. Term 14 years. Patented January 16, 1917. E. O. Fritch, assignor to Hood Rubber Co.—both of Watertown, Mass.
- 50,202. Tire. Term 14 years. Patented January 16, 1917. E. Hopkinson, New York City.

THE FUTURE RUBBER POSITION.

RUBBER manufacturers may not attach much importance to estimates of the rubber position during the next four years, but forecasts, when made by those who are able to predict with some knowledge of the conditions, are always interesting. In this connection some statistics compiled by a well-known British market authority, with regard to the production and consumption of rubber in the years 1917 to 1920, are given in articles in the London "Stock Exchange Gazette." The authority calls attention to the wonderful expansion in the production of rubber in the last six years. During this period, he points out, the output of Brazil declined to the extent of a few thousand tons, but still amounts to nearly 40,000 tons a year, while the inferior grades of the commodity formerly contributed by Africa have declined from 24,000 tons to about half that figure. Meanwhile, of course, a remarkable expansion has taken place in the plantation output. In 1905 this amounted to a total of only 145 tons; for the year just ended the total was something between 140,000 and 150,000 tons—say, one thousand times the crop of eleven years ago. In fact very nearly three-fourth of the world's crop is now derived from plantation sources. It was feared, he says, that over-production must result from the great planting boom of 1910 and 1911, during which period some 360,000 acres of land were placed under cultivation. Although these areas are now reaching maturity, so far there has not been the slightest sign of over-production; indeed, it is doubtful if the world's crop expected after 1919 will be sufficient to keep pace with the wonderful demand.

Summarizing the results of his investigations, the authority referred to puts forward the following estimates of the world's probable production and consumption of rubber in the next four years. In these estimates no allowance was made for the German and Austrian post-bellum demand of about 20,000 tons a year. Estimated total production in 1917, 235,000 tons; in 1918, 265,000 tons; in 1919, 295,000 tons; in 1920, 314,000 tons. Estimated consumption, 1917, 230,000 tons; in 1918, 260,000 tons; in 1919, 290,000 tons; in 1920, 312,000 tons. Quite apart from future requirements of the central European powers, it would appear that during the whole period supply and demand are expected to remain very nearly balanced. On peace being declared it seems not unlikely, therefore, that a shortage in supplies will be created. It remains to be seen whether even the immense areas now under cultivation in the middle east will produce sufficient rubber fully to satisfy the world's increasing demands up to 1920.

Crude Rubber During 1916.

THE crude rubber market for the year opened with the November advance still continuing. On January 4 the high mark was reached with First latex crêpe, spot, selling at \$1.05, and Upriver fine, spot, at \$1, prices which had not been equaled since the spectacular advance in August, 1914. Small stocks were responsible for the firm tone in Upriver fine, but otherwise the market was purely speculative, due to the uncertainty of arrivals. January imports at New York, however, reached 9,400 tons, the largest monthly receipts since March and April, 1915, so that on February 1, First latex and Smoked sheet had dropped to 76 cents, and Upriver fine to 73 cents.

Imports were smaller during February, and consumers were interested only in immediate requirements. Forward deliveries were uncertain, due to lack of cargo space and slow shipment. Values, however, ranged upward, reflecting the generally firm London market until on February 29 First latex, spot, was quoted at 93 to 94 cents, and Upriver fine 77 to 78 cents. Contrary to custom, London futures were at a premium over spot rubber, indicating that lack of adequate shipping facilities constantly threaten the rubber market.

March trading was steady, but comparatively small. New York arrivals showed increasing volume, and shipments of plantation rubber from the Far East by way of the Pacific Coast became more frequent. This route is slow, chiefly because of railway car shortage in America, but the war zone and its perils, also the eastern freight congestion, are avoided thereby, and consequent high cargo and insurance rates. Minor fluctuations netted a decline of 2 to 3 cents during the month.

Direct shipments to America from the Far East by way of the Pacific Coast continued in large volume during April, 5,810,127 pounds being reported as having arrived by that route. Trading was slight, and on April 25 First latex, spot, had declined to 80 cents, Smoked sheet ribbed to 79 cents, and Upriver fine to 71 cents.

May prices still sought lower levels. Apathetic trading reflected the dull tone of the London market. Because of backward spring weather the anticipated tire business did not develop, and manufacturers still had a large accumulated stock. Imports considerably exceeded the previous month, and holders of crude rubber were reluctant to accept orders under the market. Futures higher than spot rubber in New York, with the opposite prevailing in London, was a strange anomaly, reversing the February situation. On May 29 First latex, spot, had reached 67 cents, Upriver fine, spot, 66, a decline of 10 and 3 cents respectively, within four weeks.

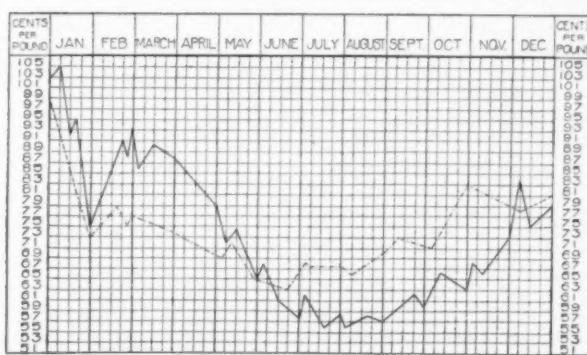
June brought only the usual desultory trading. Upriver fine, spot, had reached the low mark, 65 cents, June 1, and prices generally continued to decline, although on June 15 Upriver fine was selling at 2 cents premium over First latex. Speculative interests, however, brought the market up on June 28 to 67 cents for Upriver fine, spot, and 61 cents for First latex, spot.

Then followed four months of comparative stagnation unusual in the history of the trade. Minor fluctuations were in response to the London market. Imports continued heavy, a new record of 800 tons being established at San Francisco in July. Trading was extremely dull, sales being made in August at less than ruling prices when First latex, spot, reached its low mark of 56½ cents. Throughout this period Upriver fine took the lead in demand and price. New shipments were delayed by abnormally low water on the Amazon; stocks were scant, and heavy Russian buying still further depleted them

and advanced the price. Spot quotations in September fluctuated from 70 to 75 cents.

It was expected that the increased sale of rubber goods in October would bring an active covering of crude rubber requirements, and lower prices were indicated by reassuring reports of increased production. But the buying movement did not develop; imports were small and the trend of prices took an upward turn. The temporary fright occasioned by nearby German submarine operations sent prices up 3 to 5 cents on October 9, and although they partially subsided later, Upriver fine was quoted at 81 cents on October 30, First latex, 63½ cents.

This general upward trend in the market continued throughout the year. All grades of crude rubber were in good demand and toward the end of November trading became quite lively, with



— Upriver Fine First Latex Crêpe.

CHART SHOWING FLUCTUATIONS IN PARA AND PLANTATION SPOT RUBBER, 1916.

London shipments placed at 40 days and somewhat delayed. On November 28 Upriver fine was selling at 78 cents, First latex and Smoked sheet ribbed at 73 cents. London market conditions were generally firm with higher price levels supported by the British program of industrial expansion, and the government's requisition of more than half of the London stocks of 10,000 tons available November 1. Restricted permits at Singapore, lack of cargo space, and the loss of the "Arabia" with 350 tons of rubber on board also had their influence.

The first fortnight of December witnessed heavy buying in plantation rubber by large manufacturers. Para sorts, Africans and Centrals moved freely in sympathy with the buying activity; all recorded gains, with plantations leading the list. Holiday dullness characterized the last two weeks of the month with inquiries confined for the most part to futures. In London the sharp advance of plantations, influenced by the submarine menace, was followed by heavy forward sales that checked the buying movement. The ample supplies in sight would have stemmed the tide of an advancing market had it not been for the shortage of ship tonnage. On December 29 Upriver fine, spot, was quoted at 78 cents, First latex, spot, and Smoked sheet ribbed, spot, at 79 cents.

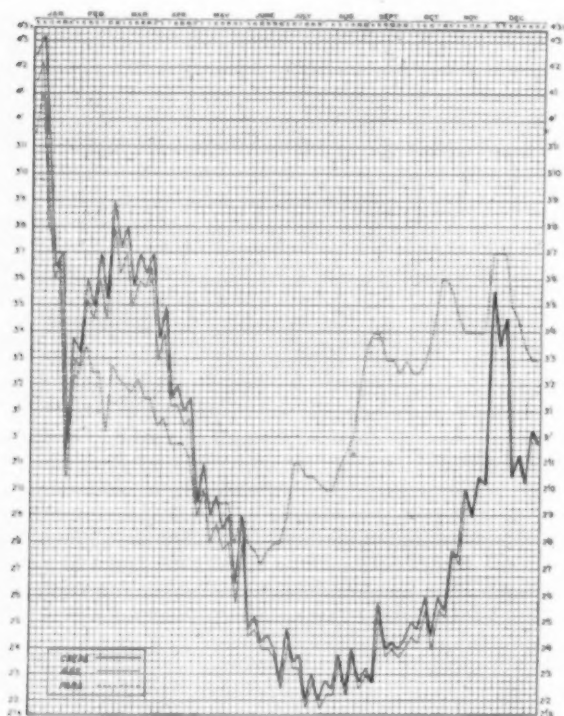
THE LONDON VIEW OF THE 1916 MARKET.

DURING the year 1916 the trade in rubber was continued under the emergency conditions introduced in 1915, and for the most part shipments have reached consumers with remarkable regularity and freedom. Lack of ship tonnage, however, became a matter of ever increasing concern and is now the big problem

facing the trade. Continued growth of the tire industry and the demands of the war have made the year's consumption of crude rubber practically equal to production, yet the world's available stock today is greater than ever before. London stocks on November 30 totaled 10,194 tons as follows: Plantation, 9,145 tons; Para, 177 tons; other kinds, 872 tons. British imports and deliveries of all sorts for the year were 68,405 and 65,018 tons respectively, the December figures being estimated. Of these amounts 58,341 and 54,800 tons, respectively, were other than Para and Peruvian.

THE MARKET.

As a result of the bear squeeze which began in November, 1915, the year 1916 opened with very high prices and on January 6 plantation crepe touched 4s. 3½d., but rapidly declined to 3s. With heavy fluctuations during the next three months crepe declined to 2s. 4d. in July and to 2s. 2d. the three succeed-



Compiled by Gove, Wilson & Stanton.

Crepe— Ribbed Smoked Sheet— Para.....

FLUCTUATIONS IN STANDARD PLANTATION GRADES AND FINE HARD PARA RUBBER, 1916.

ing months, the market being quiet in tone with small business. As in 1915, prices stiffened up in November, and aided by speculators and the reserved selling of producers reached 3s. 5½d., but the year closed quietly at 3s. Corresponding extremes for ribbed smoked sheet were 4s. 2½d. and 2s. 1½d. The fear of submarine losses and apprehension lest lack of cargo space prevent fulfilling forward contracts were important considerations contributory to the November rise.

While the demand for Para sorts has at no time equaled that for plantation, values have been well sustained and during occasional bursts of active trading prices have temporarily shown a premium over plantation. The highest and lowest quotations for the year were 4s. 1d. and 2s. 7½d. Good quality gutta percha realized high prices and the demand for balata has been constant throughout the year, Sheet closing at 3s. 2½d. and Block at 2s. 1½d.

The following closing prices for recent years may be of interest:

	Hard	Negrohead	Negrohead	Caucho
	Fine Para.	Scrappy.	Island.	Ball.
1914.....	2s. 10½d.	2s. 1½d.	1s. 3d.	2s. 4d.
1915.....	3s. 9d.	2s. 10d.	1s. 7d.	3s.
1916.....	3s. 3d.	1s. 11d.	1s. 3d.	2s. 2d.

The enormous exports of plantation rubber to the United States, estimated at £25,000,000, have influenced the level of American exchange in no small degree to the benefit of Great Britain.

THE WORLD'S PRODUCTION.

The world's total production of crude rubber of all grades is variously estimated by authorities at 178,000 to 198,000 tons, an increase of 32,000 to 52,000 tons and commonly spoken of as 25 to 28 per cent. The greater output of plantations in the Far East is chiefly responsible for this, about 75 per cent of the world's total production now coming from that source. Despite the shortage of assistants on these great estates, their rapid growth continues, as shown by the following table of the total production of crude rubber for the last three years:

	1916.	1915.	1914.
Ceylon and India.....tons	24,500	20,600	14,800
Malaya, etc.	105,500	72,800	49,700
Amazonas (Brazil, Bolivia and Peru)....	28,255	30,700	28,345
Peruvian and Caucho.....	8,245	6,800	8,655
West Coast, Africa.....	2,000	2,500	2,650
Benguela and Mossamedes.....	2,000	1,900	1,500
Loanda.....	2,000	600	450
Congo, French Congo and Soudan.....	5,000	3,000	3,900
From other sources.....	4,500	7,100	10,380
Totals.....	178,000	146,000	120,380

The production of South American rubber was somewhat increased, although including more Caucho ball and less *Manicoba* and Assare. Practically all the Amazon rubber has been consumed in 1916. Central America exported very little and almost no guayule. Increased amounts have been received from West Coast Africa, especially Congo and Soudan, but very little from East Africa and Madagascar. Although Penang doubled its supply of wild rubber, Sumatra, Java and Borneo exported less Rambong rubber but more *Hevea*. The production of jelutong and balata decreased considerably.

The following table shows the annual receipts and shipments at Para during the years 1914 to 1916:

	1916.	1915.	1914.
Receipts of Para.....tons	28,260	30,595	28,170
Receipts of Peruvian.....	8,245	6,800	8,655
Shipments of Para and Peruvian to Europe.....	12,045	14,440	15,985
Shipments of Para and Peruvian to America.....	22,185	22,960	21,690

The total 1917 production of crude rubber promises to show a further increase, although perhaps not as great as some anticipate because thinning out is wisely in active operation on many plantations. The demand shows no sign of abatement and many estates have already sold freely for 1917 and even 1918.

PLANTATION RUBBER.

While plantation acreages continue to increase in several regions of the Far East, as shown by the following estimates, the greater production of the past year is, of course, due chiefly to increased yields per acre.

	1916.	1915.	1914.
Ceylon.....acres	230,000	230,000	220,000
Malaya, Malacca.....	600,000	550,000	500,000
Borneo.....	30,000	20,000	20,000
Dutch East Indies, Java, Sumatra, etc.....	500,000	450,000	400,000
India and Burma.....	40,000	40,000	65,000
German colonies, Samoa, East and West Africa.....	12,000	12,000	40,000
Totals.....	1,412,000	1,302,000	1,245,000

Plantations, chiefly of *Castilloa*, in Mexico, West Indies and Central and South America have shown no progress and the yields have been insignificant. The same is true of Ceara plantations in East Africa.

DISTRIBUTION.

The consumption of crude rubber of the various grades has been estimated as follows:

	1916.	1915.	1914.
England	25,000	24,000	18,000
Germany, Austria, etc.	1,500	3,000	16,430
France	8,500	7,000	5,000
Russia	20,000	16,000	11,610
Italy, etc.	4,000	2,500	4,000
Japan and Australia	5,000	4,000	2,400
America and Canada	114,000	89,500	62,940
Totals	178,000	146,000	120,380

All countries show increases except the Teutonic nations, the United States, Russia and Italy being most conspicuous. Scandinavian countries and Spain are manifesting increased activity in the rubber industry.

[The figures and information used in the above review were supplied by S. Figgis & Co. and Gow, Wilson & Stanton—both of London.]

MOVEMENTS OF ALL KINDS OF RUBBER IN THE UNITED KINGDOM.

	December.			Twelve Months Ending December.		
	1916.	1915.	1914.	1916.	1915.	1914.
Dutch East Indies.....tons	855	154	...	5,538	2,863	...
French West Africa.....	11	170	20	610	724	281
Gold Coast	13	19	5	660	282	252
Other Countries in Africa.....	67	238	...	3,852	2,788	...
Peru	309	5	51	842	740	693
Brazil	1,016	822	891	10,721	12,785	12,385
British India	154	181	...	1,692	1,468	...
Straits Settlements	1,365	1,963	3,250	19,884	29,489	21,143
Federated Malay States	2,017	861	928	19,934	12,892	9,821
Ceylon and Dependencies.....	1,025	904	1,620	10,052	12,772	9,361
Other Countries	98	94	1,176	1,455	1,787	13,706
Total Imports	6,930	5,411	7,941	75,240	78,590	67,642

	December.			Twelve Months Ending December.		
	1916.	1915.	1914.	1916.	1915.	1914.
From the United Kingdom.....tons	2,993	4,522	1,565	48,459	63,520	49,072

SUMMARY OF NEW YORK RUBBER PRICES.

1916.	Upriver.		Islands.		Cametá.
	Fine.	Coarse.	Fine.	Coarse.	
January ...	\$0.77@0.99	\$0.60@0.76	\$0.75@0.90	\$0.35@0.53	\$0.39@0.54
February ...	.73@.80	.52@.60	.67@.74	.35@.38	.37@.40
March .....	.74@.78	.56@.59	.68@.71	.34@.39	.36@.40
April .....	.72@.74	.55@.57	.65@.69	.36@.40	.38@.40
May .....	.67@.72	.50@.54	.61@.67	.30@.37	.35@.38
June .....	.62@.68	.42@.50	.57@.62	.27@.31	.33@.35
July .....	.65@.68	.41@.42	.58@.59	.26@.28	.33@.34
August .....	.65@.68	.39@.40	.57@.59	.27@.28	.32@.33
September ..	.69@.74	.41@.44	.58@.62	.28@.30	.32@.33
October .....	.71@.80	.42@.46	.60@.71	.29@.33	.31@.35
November ..	.79@.83	.45@.47	.69@.72	.30@.32	.32@.33
December ..	.78@.81	.47@.56	.69@.72	.30@.34	.31@.36

AVERAGE PRICES.

1916	\$0.74	\$0.50	\$0.66	\$0.33	\$0.35 1/2
1915	.61 1/2	.47 1/2	.55 1/2	.30 1/2	.33 1/2
1914	.73 1/2	.47 1/2	.63 1/2	.31 1/2	.35 1/2
1913	.87 1/2	.58	.79 1/2	.36 1/2	.42
1912	1.11 1/2	.89 1/2	1.05 1/2	.59	.63 1/2
1911	1.18 1/2	.95	1.10 1/2	.64	.70 1/2

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur reports that the export of plantation rubber from the Federated Malay States for the month of December amounted to 5,717 tons, compared with 6,776 tons in November (which was the highest on record), and 5,111 tons for the corresponding month of 1915. The total export for the past year amounted to 62,763 tons, as against 44,524 tons in 1915 and 30,697 tons in 1914. In 1909 the total export was only 2,641 tons and in 1910 (the year of the "boom") 5,452 tons, or less than is now exported in one month. The Federated Malay States export of plantation rubber is about half of the world's output. Appended are the comparative statistics:

	1914.	1915.	1916.
January	2,542	3,473	4,471
February	2,364	3,411	5,207
March	2,418	3,418	4,429
April	2,151	2,777	3,914
May	2,069	2,708	3,956
June	2,306	3,403	5,114
July	2,971	3,687	5,053
August	1,850	3,796	5,782
September	2,879	3,984	6,376
October	2,897	4,120	5,968
November	2,889	4,636	6,776
December	3,361	5,111	5,717
Totals	30,697	44,524	62,763

EXPORTS OF INDIA RUBBER FROM PARA AND MANAOS DURING DECEMBER, 1916.

EXPORTERS.	NEW YORK.				EUROPE.				GRAND TOTALS.
	Fine.	Medium.	Coarse.	Cauch.	Fine.	Medium.	Coarse.	Cauch.	
J. Marques	114,011	36,801	143,330	115,065	409,207	90,990	124,239	10,149	609,897
Stowell & Co.	260,114	17,062	80,141	1,497	358,814	10,149	211	7,444	500,857
General Rubber Co.	135,101	8,463	78,267	3,932	225,763	...	...	...	225,763
Ad. H. Alden, Ltd.	17,862	18,318	29,920	36	66,136	135,223	...	14,612	149,835
Pires Teixeira & Co.	83,335	8,807	77,001	12,423	181,566	29,750	1,190	...	30,940
Suarez Hermanos & Co., Ltd.	56,350	...	7,383	...	63,733	...	...	10,563	74,296
G. Fradelizi & Co.	9,520	510	19,729	4,612	34,371	9,888	899	641	11,428
Seligmann & Co.	42,039	35	34	1,584	43,712	...	...	...	43,712
Sundries	73,719	160	96,742	27,319	197,940	8,381	1,423	3,300	211,850
Totals, December, 1916	792,071	90,156	532,547	166,468	1,581,242	398,471	13,044	41,619	2,036,651
From Itacoatiara	13,600	510	8,840	2,465	25,415	...	...	...	25,415
From Manaos	607,247	127,590	243,632	58,245	1,036,714	463,693	34,016	9,458	1,614,773
From Iquitos	154,816	19,011	68,404	21,283	458,404	16,786	1,796	37,771	516,465
Totals, December, 1915	1,567,734	238,157	853,423	442,461	3,101,775	878,950	48,768	150,282	4,193,304
November, 1916	831,347	91,128	278,465	105,136	1,306,076	777,886	60,979	59,652	2,534,710
October, 1916	534,595	27,873	32,933	266,489	861,890	970,163	106,884	480,473	1,713,591
September, 1916	869,014	90,689	329,205	75,342	1,364,250	639,662	39,313	193,476	2,264,499

EXPORTS OF INDIA RUBBER FROM MANAOS DURING DECEMBER, 1916.

EXPORTERS.	NEW YORK.				EUROPE.				GRAND TOTALS.
	Fine.	Medium.	Coarse.	Cauch.	Fine.	Medium.	Coarse.	Cauch.	
Tancredito Porto & Co.	184,370	42,981	57,416	19,775	304,542	103,364	6,098	15,547	128,069
General Rubber Co. of Brazil....	19,124	15,475	39,567	19,391	93,557	183,863	24,683	759	343,557
Adelbert H. Alden, Ltd.	3,778	30,330	54,455	88	88,651	127,978	34	122	231,507
Stowell & Co.	127,446	14,482	27,237	15	169,180	9,120	320	6,730	185,350
J. G. Araujo	89,261	18,240	28,222	160	135,883	17,280	...	...	17,280
Ohliger & Co.	60,958	2,440	6,232	11,541	81,141	...	...	...	81,141
G. Fradelizi	5,280	...	2,609	337	8,226	19,458	2,881	...	22,339
H. Balding	23,176	...	...	...	23,176	...	...	...	23,176
J. L. Traqueia	5,106	707	999	...	6,812	...	...	...	6,812
Mesquita & Co. ....	...	...	...	...	630	...	685	30	1,345
Totals	518,499	124,655	216,707	51,307	911,168	463,693	34,016	70,892	1,489,227
In transit, Iquitos	199,128	19,901	82,249	217,141	518,419	16,786	1,796	37,771	58,061
Totals, December, 1916	717,627	144,556	298,956	268,448	1,429,587	480,479	35,724	108,663	2,065,707
November, 1916	412,141	60,694	120,180	11,300	605,270	599,987	53,330	56,958	1,504,913
October, 1916	211,804	51,370	101,151	12,933	377,258	379,338	25,247	16,464	927,465
September, 1916	259,336	36,882	72,767	23,185	392,170	351,246	33,813	9,713	925,567
August, 1916	435,992	47,117	84,672	24,754	592,535	272,281	20,604	10,127	1,153,840
July, 1916	238,014	21,593	31,284	204,740	495,631	68,650	43,932	18,914	896,150
January to June, 1916	2,537,504	410,024	996,427	1,438,355	5,382,310	1,450,817	313,896	242,475	8,630,383

(Compiled by Stowell & Co., Manaos.)

Review of the Crude Rubber Market.

Copyright 1917.

NEW YORK.

JANUARY has proved to be a very dull and uninteresting month that closely parallels the market conditions of a year ago. While this time of year is generally unfavorable for large buying, the fact remains that the mills have been exceptionally busy, which augurs well for the future, at least. The considerable trading that has been indulged in between dealers is the only redeeming feature of an otherwise colorless rubber market. The large manufacturers appear to be well fortified with ample stocks and contract deliveries are regularly arriving. It would seem that the heavy buying interests are cautiously covering their requirements far enough ahead and in a manner that will not-bull the market. The reports of ample plantation production and surplus stocks in London are reassuring, it is true, but the constantly increasing shipping difficulties constitute a formidable portent.

On January 2, First latex crêpe and Smoked sheet ribbed, spot, were 80 cents with January-June deliveries at 77 cents. Upriver fine was quite firm around 79 cents. The generally quiet conditions that have ruled during the month were reflected in easier prices that have recorded a decline of 6 cents in plantations and 2 cents in Paras. On January 27 First latex crêpe and Smoked sheet ribbed, spot, rubber were easy at 74 cents with futures as follows: February-March, 73 to 73½; April-May, 71, and July-December, 68. Upriver fine was steady at 77 cents.

LONDON.

The London situation has been remarkably sustained, in view of possible contingencies, by ample stocks. The importers are alive to the many difficulties that harass ocean trade at this time and also the inevitable result of an unbalanced market.

Stocks of rubber in London on January 1 compared with holdings at the same date in the two preceding years are as follows:

	1916.	Tons 1915.	1914.
Centrals and South American.....	24	10	16
Mattogrosso	15	2	66
Plantation (Ceylon, Malay, etc.).....	9,892	6,618	5,904
Rangoon and Assam	3	5	3
Penang	78	51	59
Malaysian .....	...	...	1
Mozambique	13	14	185
Madagascar	14	5	3
African, etc.	152	95	192
Totals	10,199	6,809	6,704

London imports for December were 5,150 tons against 6,118 tons for November; Liverpool imports for December were 1,771 tons against 1,192 tons for November. The re-exports for December were as follows: London, 2,421 tons; Liverpool, 368 tons, compared to 4,656 and 951 tons, respectively, for November.

Prices have not changed to any great extent. On January 2, First latex crêpe and Smoked sheet ribbed were 73 cents in a firm market. On January 26, First latex crêpe and Smoked sheet ribbed had declined to 70.5 cents.

SINGAPORE.

A record quantity of 1,003 tons was catalogued for the December 6 auction, of which 586 tons were sold. There was a strong demand for First latex pale crêpe at 65.8 cents and Smoked sheet ribbed sold readily at 65 to 65.8 cents. The lower qualities sold well at an average price of 63.3 cents. The December 13 auction brought out 954 tons and only 109 tons were sold, showing the depressed market conditions. A few lots of Smoked sheet ribbed sold at 69 to 70 cents. First latex pale crêpe was not in demand and a few small sales were made at 68 to 69 cents. The average prices obtained at the last auction held in December and the first three in January are as follows: First latex pale crêpe, 63.1 cents,

and Smoked sheet ribbed, 62.36 cents. The amount sold was 1,672 tons, compared to 1,350 tons sold at the first four auctions in December.

COLOMBO.

The closing of the auction sales at Colombo due to the inability of the banks to handle drafts has made reports of price quotations impossible. Orders are therefore being sent to London for attention.

BATAVIA.

The auction of November 24, 1916, brought out 7,601 pounds, all of which was sold in a firm market, Smoked sheet ribbed bringing 65 cents. The next auction will be held on December 1, and 32,164 pounds are already registered.

MEDAN.

The fourth Medan auction was held on November 16, 1916, when 46,164 pounds were sold. First latex crêpe and Smoked sheet ribbed sold readily in a firm market. The next auction will be held November 30.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago and January 29, the current date:

PARA.	Feb. 1, 1916.	Jan. 1, 1917.	Jan. 29, 1917.
Upriver, fine, new.....	76 @	78 @	77 @
Upriver, fine, old.....	.....	.....	.....
Islands, fine, new.....	69 @	70 @	72 @
Islands, fine, old.....	.....	.....	.....
Upriver, coarse, new....	54 @	53 @	50 @
Upriver, coarse, old....	.....	.....	.....
Islands, coarse, new....	35 @	34 @	31 @
Islands, coarse, old....	.....	.....	.....
Cametá	37 @	33 @	32 @
Caucho, ball, upper....	59 @ 61	54 @	51 @
Caucho, ball, lower....	56 @	50 @	49 @
PLANTATION.			
First latex crêpe.....	78 @	{ Spot... 79 @ Futures 76 @	{ Spot... 75 @ 75½ Apr.-June 72 @
Amber crêpe, light.....	.....	{ Spot... 75 @ Futures 73 @	{ Spot... 71 @ 72 Futures.....
Brown crêpe, clean.....	.....	{ Spot... 74 @ Futures 69 @ 70	{ Spot... 70 @ 71 Futures.....
Smoked sheet, ribbed..	78 @	{ Spot... 79 @ Futures 76 @	{ Spot... 75 @ 75½ Apr.-June 72 @
Fine sheets and biscuits, unsmoked	78 @	.....	.....
CENTRALS.			
Corinto	53 @ 56	51 @	49 @
Esmeralda, sausage	54 @ 55	50 @	47 @ 48
Nicaragua, scrap	53 @ 54	48 @	47 @
Mexican plantation, sheet	60 @ 61	49 @	54 @ 56
Mexican, scrap	53 @ 54	48 @	46 @
Mexican, slab	35 @ 36	34 @	31 @
Manicoba	45 @ 46	35 @ 36	42 @
Mangabeira, sheet	35 @ 38	36 @	40 @
Guayule	41 @ 42	42 @ 44	42 @ 44
Balata, sheet	64 @	75 @	78 @ 78½
Balata, block	46 @	63 @	64 @ 64½
AFRICAN.			
Lopori, ball, prime.....	.....	.....	.....
Lopori, strip, prime....	.....	.....	.....
Upper Congo, ball, red.	.....	.....	.....
Rio Nunez Niggers.....	72 @	62 @	62 @ 63
Conakry Niggers	76 @ 77	60 @	60 @ 62
Massai, red	71 @ 72	60 @	60 @
Soudan, Niggers .....	.....	.....	.....
Cameroon, ball, soft....	.....	.....	.....
Cameroon, ball, hard....	.....	.....	.....
Benguela, No. 2, Superior	40 @ 41	39 @	44 @
Benguela, No. 2	40 @ 41	34 @	41 @
Accra, flake	40 @	30 @	30 @
EAST INDIAN.			
Assam .....	.....	.....	50 @
Pontianak	8½ @ 8½	8½ @	9½ @
Gutta Siak	13 @ 13½	14 @	.....
Gutta red Niger.....	.....	28 @	22 @
Borneo III	35 @ 35½	.....	.....
Gutta Percha, red Macassa	1.50 @ 2.00	1.90 @	1.90 @

COMPARATIVE NEW YORK PRICES FOR JANUARY.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows:

"During January the market for commercial paper in the rubber line has continued steady, the best names selling freely at 4@4½ per cent, and those not so well known 4½@5 per cent, with some small names at 5½ per cent."

	1917.*	1916.	1915.
Upriver, fine	\$0.76@0.79	\$0.77@0.99	\$0.61@0.73
Upriver, coarse .....	.50@.53	.60@.76	.45@.58
Islands, fine .....	.67@.70	.75@.90	.53@.70
Islands, coarse .....	.32@.36	.35@.53	.29@.37
Cameta .....	.33@.35	.39@.54	.31@.41

*Figured only to January 27.

MARKET CABLE SERVICE FROM LONDON.

The following market report has been cabled from Aldens' Successors, Limited, London:

Date.	Standard Crêpe.	Ribbed Smoked Sheet.	Market.
December 27	70	70	Quiet
January 2	73	73	Firm
January 8	73	73	Firm
January 15	72	72	Firm
January 22	71.5	72	Steady

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by The Waterhouse Co., Limited:

Date.	Crêpe. Price per lb.	Smoked Sheet. Price per lb.	Tons Sold.	Market.
December 29	61.63	57.8	368	Fair demand for best grades.
January 6, 1917....	64.18	64.6	494	Good demand for all descriptions.
January 13	64.6	64.6	425	Market dull.
January 19	62.05	62.48	367	Market dull. Supplies are large.

WEEKLY RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [December 13, 1916]: There was a very poor demand at the auction held today, and of a total of 960 tons catalogued for sale only 181 tons changed hands. Bidding throughout was very slow and owing to the absence of competition the majority of parcels were withdrawn. At the opening \$165 was paid for one lot each of Standard Crêpe and Standard Sheet, but as the sale progressed the falling off in the demand for these grades was most marked, a good number of lots not even eliciting bids. The lower grades are about \$4 lower on the week. There was no scrap sold. The following was the course of values:

	In Singapore per picul.*	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked....	\$155@165	3/ @ 3/ 2 1/4	72.98@85.39
Sheet, good ribbed smoked....	155@157	3/ @ 3/ 1/2	72.98@73.99
Sheet, plain smoked.....	142@147	2/9 3/4 @ 2/10 3/4	68.41@70.18
Sheet, plain unsmoked.....	137@143	2/8 1/4 @ 2/ 9/2	65.37@67.91
Crêpe, fine pale.....	161@165	3/1 1/4 @ 3/ 2 1/4	75.51@77.28
Crêpe, fine brown.....	137@146	2/8 1/4 @ 2/10 3/4	65.37@69.17
Crêpe, good brown.....	116@130	2/3 3/4 @ 2/ 6 3/4	56.51@62.33
Crêpe, dark	108@129	2/2 1/4 @ 2/ 6 3/4	52.95@62.08
Crêpe, bark	86@113	1/9 1/2 @ 2/ 3/4	43.58@55.24

*Picul = 133 1/4 pounds.

Quoted in S. S. dollars = 2/4 [56.7 cents].

PLANTATION RUBBER FROM THE FAR EAST.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1916, to dates named, excluding all foreign transshipments. Reported by Barlow & Co., Singapore.)

To—	From				Totals.
	Singapore.	Malacca.	Penang.	Port Swet- tenham.	
	October 31, 1916.	October 31, 1916.	October 31, 1916.	November 30, 1916.	
United Kingdom	26,854,241	6,376,557	21,416,167	27,983,933	82,630,898
The Continent	9,366,270		55,733		9,422,003
Japan	3,508,344				3,508,344
Ceylon	604,283		563,600	1,615,073	2,782,956
United States	69,509,518		9,105,067	1,716,875	80,331,460
Australia	268,302				268,302
Totals	110,110,958	6,376,557	31,140,567	31,315,881	178,943,963
Same period, 1915....	66,782,158	6,617,032	24,322,531	26,116,143	123,837,864
Same period, 1914....	32,919,222	4,108,376	20,009,367	29,316,677	86,353,642
Same period, 1913....	21,830,702		12,925,467	25,540,448	60,296,617

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to November 27, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
United States	16,705,051	24,193,954
Canada and Newfoundland.....	392,495	6,720
France	497,892	1,587,537

Russia	332,200	248,874
Italy		164,640
United Kingdom	21,856,188	20,113,766
Australia	791,277	783,651
India	1,530	1,358
Straits Settlements	119,933	43,680
Japan	260,421	315,529
Totals	40,956,988	47,459,709

(Same period 1914, 32,205,528 pounds; same period 1913, 23,387,980.) The export figures of rubber, given in the above table for 1914, include the imports reexported. (These amount to 2,686,710 pounds from the Straits Settlements and 714,637 pounds from India.) To arrive at the total quantity of Ceylon rubber exported for that year deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram from Singapore gives the figures of the export of plantation rubber from Straits Settlements ports during the month of November as 5,247 tons, against 5,233 tons in October last and 4,292 tons in the corresponding month last year. This gives a total of 45,431 tons for eleven months of the current year, against 31,886 tons in 1915 and 17,393 tons in 1914. Appended are the comparative figures:—

	1914.	1915.	1916.
January	1,181	2,576	4,443
February	1,703	2,741	3,359
March	1,285	2,477	4,481
April	1,548	1,978	4,219
May	1,309	3,588	3,274
June	1,480	2,249	3,836
July	1,584	2,324	5,106
August	1,325	2,295	3,246
September	1,602	4,725	2,987
October	2,006	2,641	5,233
November	2,370	4,292	5,247
Totals	17,393	31,886	45,431

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.

IMPORTS.

November, 1916.

From—	Para Rubber	Para Rubber for Treatment.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Malay Peninsula—					
Port Swettenham.....	1,654,666	34,933			
Teluk Anson	1,191,866				
Muar	878,266				
Penang	480,266	106,933		1,333	
Malacca	385,466	671,866			
Kelantan	145,466	9,886			
Port Dickson	119,600				1,066
Kuantan	38,933				
Rengat	10,800				
Mersing	9,466				
Totals	4,914,795	323,618		1,333	1,066
Borneo—					
Sarawak	145,200	56,133	4,533	12,133	1,240,000
Bandjermassin	111,466	19,200		69,466	218,266
Pontianak	93,200	4,400	3,200	1,333	33,200
Labuan	37,866	10,133		4,533	62,533
Iesselton	32,800	27,573		533	
Sambas	32,133				16,000
Kudat	31,200	27,866		266	
Sandakan	27,200	27,733	1,866		266
Passir	13,200				
Singawang	6,133				
Samarinda	4,133		4,000	3,466	
Sampit	2,666				256,000
Sibu	800				92,133
Totals	557,997	419,198	14,132	91,730	1,918,398
Sumatra—					
Djambi	262,800			4,666	
Deli	128,533	540,800			
Belawan	42,666	314,933			
Palembang	20,933				279,333
Indraghiri	13,333	17,066			11,466
Asahan	8,666	65,066			
Siak	6,000				
Bengkalis	3,200				
Muntok	933				
Totals	487,064	937,865		4,666	290,799
Java—					
Sourabaya	97,866				
Batavia	63,166				
Totals	161,032				
Siam—					
Patani	1,733				
Bangkok	1,066				
Total	2,799				
Burma—					
Rangoon	4,266				
Other ports	336,533	154,800	6,133	6,533	120,666
Grand Totals	6,464,486	1,835,481	20,263	104,262	2,330,929

EXPORTS.

November, 1916.

To—	Para Rubber	Borneo	Gutta	Gutta
NORTH AMERICA:	Rubber.	Trans.	Rubber.	Percha. Jelutong.
United States—				
New York	4,648,266	776,800	193,600	1,774,266
Akron	2,493,733	138,400		
Seattle	1,997,866	13,733		
Boston	31,466		160,800	1,125,000
San Francisco	20,266			
Canada—				
Ontario (Toronto)	45,200			
Totals	9,236,797	928,933	354,400	2,899,866
Europe:				
United Kingdom—				
England—				
Liverpool	814,800	1,819,466	153,866	41,066
Russia (Vladivostok)	123,866	207,466		147,200
France (Marseilles)	156,933			
Totals	1,207,199	2,026,932	153,866	188,266
Grand Totals	10,443,996	3,055,865	510,266	3,088,132

LONDON AND LIVERPOOL RUBBER STATISTICS.

IMPORTS.

November, 1916.

UNMANUFACTURED—	London.	Liverpool.		
Crude rubber:	Pounds.	Value.	Pounds.	Value.
From German West Africa .....	.....	.....	10,500	\$5,131
France .....	.....	.....	44,600	33,201
French West Africa .....	.....	.....	41,500	22,115
Portuguese E. Africa	17,200	\$9,791	.....	.....
Java	780,400	485,320	.....	.....
Other Dutch Possessions in Indian Seas	1,013,300	622,727	.....	.....
Liberia .....	.....	.....	2,600	795
United States	3,400	896	.....	.....
Mexico	4,300	2,047	.....	.....
Nicaragua	1,300	524	.....	.....
Venezuela	900	443	.....	.....
Brazil .....	.....	.....	2,036,200	1,203,890
Gold Coast .....	.....	.....	68,700	21,734
Nigeria .....	.....	.....	96,700	34,453
Cape of Good Hope	48,100	34,653	.....	.....
British East Africa	5,900	2,699	6,700	2,856
Zanzibar	20,200	10,172	.....	.....
Uganda	800	500	.....	.....
Nyasaland	7,200	3,308	.....	.....
Seychelles	700	333	.....	.....
British India	180,900	105,934	2,200	1,095
Straits Settlements	2,659,300	1,841,977	304,100	201,591
Fed. Malay States	6,713,900	4,055,678	15,700	9,487
Ceylon and Dependences	1,974,200	1,196,973	41,600	27,042
British N. Borneo	259,800	138,568	.....	.....
New South Wales	6,300	4,746	.....	.....
Fiji Islands	4,500	2,380	.....	.....
British West India	2,500	1,528	.....	.....
British Guiana	400	209	.....	.....
Totals	13,705,500	\$8,521,406	2,671,100	\$1,563,390
Waste and reclaimed rubber:				
From Canary Islands	1,800	\$95	.....	.....
United States	69,700	9,539	16,300	\$2,518
Brazil .....	.....	.....	380	405
Channel Islands	1,000	48	.....	.....
Egypt	8,700	843	.....	.....
Natal	7,800	240	.....	.....
Ceylon and Dependences	4,800	195	.....	.....
New Zealand	7,800	638	.....	.....
Canada	7,600	2,333	.....	.....
Totals	109,300	\$13,931	20,100	\$2,923

EXPORTS.

Waste and reclaimed rubber manufactures of the United Kingdom:	To France	Italy	United States	Straits Settlements
	121,800	42,100	982,000	24
	\$8,149	2,594	66,459	

PARAS FROM BRAZIL.

JANUARY 6, 1917.—By the <i>Sao Paulo</i> from Para and Manaos:	POUNDS.
Pell & Dumont	40,500
H. A. Astlett & Co.	140,900
Henderson & Korn	11,300
Crossman Sielcken	48,400
Muller, Schall & Co.	112,200
Knauth, Nachod & Kuhne ..	17,000
Paul Bertuch	23,300
Meyer & Brown	13,200
Arnold & Zeiss	92,400
W. R. Grace & Co.	3,300
E. F. Granier	147,000
Wm. A. Brown & Co.	14,700
Totals	653,200

JANUARY 24.—By the *Hubert* from Para:

JANUARY 24.—By the Hubert from Paris:	
H. A. Astlett & Co.....	81,500
Arnold & Zeiss	185,000
W. R. Grace & Co.....	5,000
Hagemeyer & Brunn.....	5,000
Paul Bertuch	139,000
Aldens' Successors, Ltd.....	2,500
J. Henry Schroeder & Co.....	163,500
Various	946,500
Totals	1,550,500

November, 1916.

UNMANUFACTURED—

UNMANUFACTURED—	London		Liverpool.	
	Pounds.	Value.	Pounds.	Value.
New South Wales.....	9,900	1,323	.....	.....
Canada.....	88,200	4,079	.....	.....
Norway.....	.....	.....	6,700	1,023
Spain.....	.....	.....	90,100	9,334
Totals.....	1,244,000	\$82,628	106,800	\$11,866
Crude rubber:	RE-EXPORTS.			
To Russia.....	1,626,100	\$992,255	1,334,900	\$656,564
Sweden.....	100	71	.....	.....
Norway.....	62,800	39,670	.....	.....
France.....	1,437,200	861,189	286,100	177,838
Italy.....	480,100	256,916	23,500	16,560
United States.....	6,232,700	3,504,873	355,300	108,889
Argentina.....	11,000	6,859	.....	.....
Canada.....	579,500	320,834	65,800	30,093
Spain.....	.....	.....	31,300	17,303
Japan (including Formosa and leased territories in China).....	.....	.....	800	195
Victoria.....	.....	.....	33,600	23,824
Totals.....	10,429,500	\$5,982,667	2,131,300	\$1,031,266
Waste and reclaimed rubber:				
To France.....	29,900	\$10,615	.....	.....
Italy.....	.....	.....	35,600	\$8,639
Totals.....	\$29,900	\$10,615	\$35,600	\$8,639

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

[The Figures Indicate Weight in Pounds.]

PARAS FROM BRAZIL.

Arrivals by steamers *Minas Geraes*, *Gregory*, *Atahualpa* and *Cuthbert* are incomplete due to information being withheld by the steamship companies.DECEMBER 18.—By the steamer *Minas Geraes* from Pará:

	Fine.	Medium.	Coarse.	Cauch.	Total.
H. A. Astlett & Co.	57,040	11,200	69,440		128,000
Muller, Schall & Co.	81,280	5,760	64,200		180,000
Various					742,000
Totals					1,050,000

DECEMBER 26.—By the steamer *Gregory* from Pará:

Aldens' Successors, Ltd.	48,000	22,000	86,000		156,000
H. A. Astlett & Co.	31,900	24,600	31,300	11,200	99,000
W. R. Grace & Co.	83,200		27,400	23,800	134,400
Various					487,400

JANUARY 3.—By the steamer *Atahualpa* from Pará:

	(Cameta)	Total.
General Rubber Co.	6,000	55,000
Henderson & Korn	4,420	61,200
H. A. Astlett & Co.	4,480	107,520
Arnold & Zeiss	132,800	9,280
Various		55,800
Totals		475,000

JANUARY 5.—By the *Cuthbert* from Pará and Manaos:

Raw Products Co.					75,500
Pell & Dumont					40,500
H. A. Astlett & Co.					245,000
Henderson & Korn					12,000
Meyer & Brown					20,500
General Rubber Co.	35,520	2,560	11,400		49,500
Arnold & Zeiss	19,150	7,680	45,000	520	72,300
Aldens' Successors, Ltd.	14,000	34,000	73,000		121,000
W. R. Grace & Co.	50,987				51,000
Various					813,700
Totals					1,500,000

JANUARY 8.—By the steamer *Sao Paulo* from Pará and Manaos:

H. A. Astlett & Co.	113,600	3,520	95,000	71,500	283,620
Pell & Dumont			16,800		16,800
Muller, Schall & Co.		100,160			100,160
W. R. Grace & Co.	2,970			9,520	12,490
Paul Bertuch	3,200		600		3,800
Meyer & Brown			18,000		18,000
Arnold & Zeiss	58,880	4,800	22,200		85,880
Various	86,960	1,920	31,800	25,800	146,480
Totals	265,610	110,400	184,400	106,820	667,230

PARAS.

JANUARY 18.—By the <i>Advance</i> —Cristobal:	POUNDS.
W. R. Grace & Co.	23,400

CENTRALS.

DECEMBER 22.—By the <i>Caracas</i> —Puerto Cabello:	POUNDS.
American Trading Co.	440
DECEMBER 22.—By the <i>Almirante</i> —Cartagena:	POUNDS.
Pablo Calvet & Co.	5,280
G. Amsinck & Co.	5,280
DECEMBER 22.—By the <i>Advance</i> —Colon:	POUNDS.
Mecke & Co.	4,950

POUNDS.		POUNDS.		POUNDS.	
DECEMBER 23.—By the <i>Mayaro</i> =Trinidad:		JANUARY 23.—By the <i>Panama</i> =Cristobal:		DECEMBER 23.—By the <i>Mongolia</i> =London:	
Yglesias Lobo & Co.	13,640	G. Amsinck & Co.	13,400	Rubber Trading Co.	10,500
DECEMBER 26.—By the <i>El Valle</i> =Galveston:		G. Gontard	4,500	Charles T. Wilson Co., Inc.	24,000
Various	13,850	W. R. Grace & Co.	4,300	Goodyear Tire & Rubber Co.	189,600
DECEMBER 26.—By the <i>Angamos</i> =Chile:		J. S. Sembrada & Co.	1,200	L. Littlejohn & Co.	161,800
Muller, Schall & Co.	5,170	Andean Trading Co.	8,400	Various	65,800 451,700
DECEMBER 26.—By the <i>Monterey</i> =Vera Cruz:		G. Ph. Nider	6,000	DECEMBER 24.—By the <i>Tuscan Prince</i> =Singapore:	
J. A. Medina & Co.	350	Lawrence Turnure & Co.	6,200	I. T. Johnstone & Co.	590,500
DECEMBER 27.—By the <i>Panama</i> =Cristobal:		Dumarest Bros.	4,700	Rubber Trading Co.	77,000
G. Amsinck & Co.	60,500	Lawrence Johnson	1,200	Fred. Stern & Co.	44,000
W. R. Grace & Co.	4,200	Pablo Calvet & Co.	2,600	W. R. Grace & Co.	39,600
Neuss, Hesslein & Co.	27,060	J. Touse & Co.	3,700	East Asiatic Co.	77,700
Fidanque Bros. & Co.	7,040 98,800	D. C. Andrews	3,000	Meyer & Brown	68,500
DECEMBER 29.—By the <i>Mexico</i> =Acajutla:		Otto Gerda & Co.	44,200	Arthur Meyer & Co.	201,500
G. Amsinck & Co.	440	Piza Nephews & Co.	2,600	Fox & Co.	53,000
DECEMBER 29.—By the <i>Mexico</i> =Corinto:		Various	12,800 118,400	Robinson & Co.	187,700
G. Amsinck & Co.	3,500	JANUARY 25.—By the <i>Steinstad</i> =Guayaquil:		E. G. Curry	257,600
Meyer Hecht	220 3,720	G. Amsinck & Co.	5,300	Charles T. Wilson Co., Inc.	182,000
JANUARY 2.—By the <i>Ancon</i> =Cristobal:		Pablo Calvet & Co.	28,500	Aldens' Successors, Ltd.	30,000
J. S. Sembrada & Co.	28,150	A. M. Capen's Sons	1,600	Henderson & Korn	768,700
A. M. Capen's Sons	6,900	D. C. Andrews & Co.	2,500	Goodyear Tire & Rubber Co.	123,000
Pablo Calvet & Co.	15,950	Otto Gerda & Co.	34,100	Robert Badenhop & Co., Inc.	64,800
D. C. Andrews & Co.	1,400	Piza Nephews & Co.	1,200 73,100	Edward Maurer & Co., Inc.	48,000
Heilbron, Wolf & Co.	2,600	AFRICANS.		United Malaysian Rubber Co.	2,800
Mecke & Co.	2,200	DECEMBER 18.—By the <i>Buffalo</i> =Hull:		Mexican Crude Rubber Co.	15,000
G. Amsinck & Co.	18,800	Aldens' Successors, Ltd.	113,100	W. Staton	6,900
Lawrence Turnure & Co.	6,250	Charles T. Wilson Co., Inc.	12,600 125,700	L. Littlejohn & Co.	1,102,500
Andean Trading Co.	6,800	DECEMBER 18.—By the <i>St. Jean</i> =Bordeaux:		Arnold & Zeiss	358,000
Lawrence Johnson & Co.	11,000	Various	30,000	William H. Stiles	70,000 4,368,800
L. Touse & Co.	4,700	DECEMBER 20.—By the <i>Cannizaro</i> =Hull:		DECEMBER 26.—By the <i>Michigan</i> =London:	
Dumarest Bros.	4,150 108,900	Aldens' Successors, Ltd.	164,800	Raw Products Co.	22,000
JANUARY 5.—By the <i>Carrillo</i> =Cartagena:		Robert Badenhop & Co., Inc.	9,800 174,600	Goodyear Tire & Rubber Co.	207,000
G. Amsinck & Co.	10,450	William H. Stiles	13,500	L. Littlejohn & Co.	38,000
JANUARY 8.—By the <i>Esperanza</i> =Vera Cruz:		DECEMBER 29.—By the <i>Chicago</i> =Bordeaux:		Fred. Stern & Co.	27,000 294,000
C. Tennant Sons & Co.	64,750	Aldens' Successors, Ltd.	165,000	DECEMBER 26.—By the <i>Ascania</i> =London:	
Vera Cruz Trading Co.	350	Robert Badenhop & Co., Inc.	30,800	The B. F. Goodrich Co.	340,000
The Canada-Mexico Corporation	1,050	Robinson & Co.	10,500 206,300	Aldens' Successors, Ltd.	251,000
J. A. Medina & Co.	1,220	JANUARY 5.—By the <i>Ansonia</i> =London:		Arnold & Zeiss	68,000
H. Marquardt & Co.	520 67,890	Aldens' Successors, Ltd.	31,000	Michelin Tire Co.	57,500
JANUARY 10.—By the <i>Colon</i> =Cristobal:		JANUARY 9.—By the <i>Gogajo</i> =Lisbon:		L. Littlejohn & Co.	147,000
G. Amsinck & Co.	15,500	William H. Stiles	90,000	Various	51,000 914,500
Lawrence Turnure & Co.	1,650	JANUARY 15.—By the <i>Minnehaha</i> =London:		DECEMBER 27.—By the <i>Carmania</i> =Liverpool:	
Lawrence Johnson & Co.	400	Aldens' Successors, Ltd.	132,000	Various	25,000
Henry W. Peabody	1,200	JANUARY 16.—By the <i>Monadnock</i> =Bordeaux:		DECEMBER 27.—By the <i>Valeria</i> =London:	
Comacho, Roldan & Van Sickle	2,750	Rubber Trading Co.	11,200	L. Littlejohn & Co.	89,560
Pablo Calvet & Co.	21,000	Various	170,200 181,400	JANUARY 2.—By the <i>Manchuria</i> =London:	
L. Touse & Co.	3,200	JANUARY 23.—By the <i>Oberon</i> =Lisbon:		Charles T. Wilson Co., Inc.	162,000
Dumarest Bros.	1,400	Edward Maurer & Co., Inc.	125,500	Hagemeyer Trading Co.	26,000
Otto Gerda & Co.	12,100	JANUARY 25.—By the <i>Colorado</i> =Hull:		Aldens' Successors, Ltd.	29,000
J. S. Sembrada & Co.	6,350	Hagemeyer Trading Co.	22,400	Raw Products Co.	454,500
A. M. Capen's Sons	6,050	JANUARY 26.—By the <i>Owego</i> =Lisbon:		United States Rubber Co.	103,000
Mecke & Co.	2,750	Various	160,000	Charles T. Wilson Co., Inc.	13,600
Lanman & Kemp	2,750	MANICOBAS.		W. R. Grace & Co.	57,000
Piza Nephews & Co.	1,750	DECEMBER 23.—By the <i>Racburn</i> =Bahia:		Goodyear Tire & Rubber Co.	86,000
Pottberg, Ebeling & Co.	200	Adolph Hirsch & Co.	16,500	L. Littlejohn & Co.	915,000
Various	19,100 98,150	DECEMBER 31.—By the <i>Atahualpa</i> =Ceara:		Arthur Meyer & Co.	93,000
JANUARY 13.—By the <i>Santa Marta</i> =Cartagena:		J. H. Rossbach & Bro.	49,500	East Asiatic Co.	220,000
Pablo Calvet & Co.	550	JANUARY 5.—By the <i>Cuthbert</i> =Para:		Edward Maurer & Co., Inc.	33,000
Andean Trading Co.	5,700	Hagemeyer Trading Co.	57,000	Robinson & Co.	154,000
A. Held	750 7,000	JANUARY 8.—By the <i>Sao Paulo</i> =Santos:		Fred. Stern & Co.	167,600
JANUARY 15.—By the <i>Sixola</i> =Puerto Cortez:		Various	97,500	William H. Stiles	45,000
G. Amsinck & Co.	100	JANUARY 12.—By the <i>Matura</i> =Pernambuco:		Meyer & Brown	95,000
Ergeis & Heinlein	750	Middleton & Co.	1,900	Fox & Co.	33,000
J. S. Sembrada & Co.	2,950 3,800	R. Van Wolterbeek	850 2,750	Arnold & Zeiss	150,700 3,054,400
JANUARY 16.—By the <i>Metapan</i> =Port Limon:		JANUARY 24.—By the <i>Hubert</i> =Ceara:		JANUARY 8.—By the <i>City of Florence</i> =Colombo:	
Fruit Dispatch Co.	750	J. H. Rosenthal & Bros.	5,500	William H. Stiles	37,000
Isaac Brandon & Bros.	550 1,300	PLANTATIONS.		Various	229,700 266,700
JANUARY 18.—By the <i>Almirante</i> =Cartagena:		DECEMBER 18.—By the <i>Mesaba</i> =London:		JANUARY 9.—By the <i>Gogajo</i> =Lisbon:	
Pablo Calvet & Co.	950	Charles T. Wilson Co., Inc.	9,000	Various	181,000
Muller, Schall & Co.	3,300	Rubber Trading Co.	1,600	JANUARY 9.—By the <i>Feyle</i> =London:	
G. Amsinck & Co.	5,150	L. Littlejohn & Co.	113,000	I. T. Johnstone & Co.	83,900
R. del Castillo Co.	1,750 11,150	Fred. Stern & Co.	8,000 131,600	Raw Products Co.	6,700
JANUARY 18.—By the <i>Caracas</i> =Puerto Cabello:		DECEMBER 18.—By the <i>Kandahar</i> =Colombo:		Firestone Tire & Rubber Co.	800
Scholtz & Co.	1,540	L. Littlejohn & Co.	208,000	Aldens' Successors, Ltd.	289,000
JANUARY 18.—By the <i>Advance</i> =Cristobal:		William H. Stiles	57,000	Hagemeyer Trading Co.	18,600
G. Amsinck & Co.	4,950	Various	762,000 1,027,000	L. Littlejohn & Co.	11,000
Neuss, Hesslein & Co.	3,500	DECEMBER 19.—By the <i>Adriatic</i> =Liverpool:		Meyer & Brown	63,500
R. G. Barthold & Co.	400	Various	5,000	Arnold & Zeiss	47,000
Meyer Hecht	200	DECEMBER 20.—By the <i>Madison</i> =Batavia:		Herman Weber	6,000
Gontard & Co.	8,350	General Rubber Co.	378,000	Fuchs & Lang	1,000
American Trading Co.	6,700	G. Amsinck & Co.	279,000	Various	183,700 711,200
Isaac Brandon & Bros.	400	I. T. Johnstone & Co.	2,900		
Fidanque Bros. & Co.	550 25,050	Meyer & Brown	21,000		
JANUARY 22.—By the <i>Pastores</i> =Port Limon:		Stein, Hirsch & Co.	32,500		
Isaac Brandon & Bros.	650	Aldens' Successors, Ltd.	5,000		
JANUARY 22.—By the <i>Monterey</i> =Tampico:		Manhattan Rubber Mfg. Co.	33,000		
C. Tennant Sons & Co.	38,700	The B. F. Goodrich Co.	201,600		
H. Marquardt & Co.	1,500	Raw Products Co.	11,800		
Various	14,700 54,900	East Asiatic Co.	2,000		
JANUARY 22.—By the <i>Monterey</i> =Vera Cruz:		Various	1,850,000 4,710,900		
G. Schumann & Co.	2,600				
U. S. Brokerage	100 2,700				

POUNDS.	
JANUARY 13.—By the <i>City of Manchester</i> —	
Colombo:	
J. T. Johnstone & Co.	100,700
Charles T. Wilson Co., Inc.	13,700
Aldens' Successors, Ltd.	11,000
Rubber Trading Co.	6,000
Hagemeyer Trading Co.	2,800
Goodyear Tire & Rubber Co.	10,800
L. Littlejohn & Co.	200,600
Robinson & Co.	39,900
Meyer & Brown.	67,000
East Asiatic Co.	34,800
Arthur Meyer & Co.	7,000
Arnold & Zeiss.	13,000
Edward Maurer & Co., Inc.	2,000
William H. Stiles.	118,000
W. R. Grace & Co.	36,000
	683,300

JANUARY 15.—By the <i>Patagonia</i> —Colombo:	
Hagemeyer Trading Co.	24,100
William H. Stiles.	47,000
W. R. Grace & Co.	4,400
Various	378,000
	453,500

JANUARY 15.—By the <i>Minnehaha</i> —London:	
Aldens' Successors, Ltd.	284,000
L. Littlejohn & Co.	34,600
Goodyear Tire & Rubber Co.	381,000
Michelin Tire Co.	90,500
Arnold & Zeiss.	65,700
Arthur Meyer & Co.	29,900
Fred. Stern & Co.	22,900
Various	214,900
	1,123,500

JANUARY 15.—By the <i>Eurydouch</i> —Singapore:	
General Rubber Co.	33,600
J. T. Johnstone & Co.	102,000
Henderson & Korn.	260,600
William H. Stiles.	11,000
Charles T. Wilson Co., Inc.	38,000
L. Littlejohn & Co.	184,900
Robinson & Co.	25,000
Arthur Meyer & Co.	22,000
Arnold & Zeiss.	67,500
East Asiatic Co.	17,600
W. R. Grace & Co.	8,900
Fred. Stern & Co.	1,800
Hagemeyer Trading Co.	17,000
Edward Maurer & Co., Inc.	1,700
	791,600

JANUARY 16.—By the <i>Finland</i> —Liverpool:	
Various	1,000

JANUARY 19.—By the <i>Orduna</i> —Liverpool:	
Various	25,500

JANUARY 19.—By the <i>Pannonia</i> —Liverpool:	
Rubber Trading Co.	10,500
The B. F. Goodrich Co.	339,000
Hagemeyer Trading Co.	63,000
J. T. Johnstone & Co.	270,000
United States Rubber Co.	115,000
Michelin Tire Co.	130,600
Robinson & Co.	55,000
L. Littlejohn & Co.	90,500
	1,073,600

JANUARY 24.—By the <i>Rotti</i> —Batavia:	
General Rubber Co.	786,500
J. T. Johnstone & Co.	2,900
Raw Products Co.	29,000
Hagemeyer Trading Co.	19,000
Winter & Sons.	1,000
Ned. Handel Escompte Maatschappij.	3,900
Ned. Handel Maatschappij.	103,900
Grove-White Co., Ltd.	5,500
G. Amsinck & Co.	273,500
Meyer & Brown.	21,000
L. Littlejohn & Co.	2,700
Charles F. Smellie & Co.	167,500
East Asiatic Co., Ltd.	17,600
Stein, Hirsch & Co.	57,000
Hartman Bros., Inc.	1,600
Everett, Carleton & Co.	32,000
W. R. Grace & Co.	29,000
Various	2,192,600
	3,745,200

JANUARY 24.—By the <i>Saxonia</i> —Liverpool:	
Various	7,900

JANUARY 25.—By the <i>Manhattan</i> —London:	
Rubber Trading Co.	12,000
Hagemeyer Trading Co.	9,500
Thornett & Fehr.	800
C. Hirsch & Co.	36,000
W. R. Grace & Co.	29,000
Various	16,000
	83,300

JANUARY 26.—By the <i>Philadelphian</i> —London:	
Goodyear Tire & Rubber Co.	151,000

JANUARY 26.—By the <i>Madrid</i> —Calcutta:	
Various	584,000

BALATA.

DECEMBER 23.—By the <i>Mayaro</i> —Trinidad:	
American Trading Co.	47,080
Edward Maurer & Co., Inc.	5,280
	52,360
DECEMBER 26.—By the <i>Pastores</i> —Bocas del Toro:	
H. Marquardt & Co.	4,830
Gontard & Co.	10,120
	14,950

POUNDS.	
DECEMBER 27.—By the <i>Panama</i> —Cristobal:	
Gontard & Co.	8,280

JANUARY 5.—By the <i>Carrillo</i> —Cartagena:	
G. Amsinck & Co.	1,200

JANUARY 8.—By the <i>Tenadores</i> —Bocas del Toro:	
H. Marquardt & Co.	3,680
Eggers & Heinlein.	1,840
Gontard & Co.	6,670
	12,190

JANUARY 9.—By the <i>Keyview</i> —Demerara:	
Middleton & Co.	11,000
Edward Maurer & Co., Inc.	19,800
J. P. Watson.	13,200
	44,000

JANUARY 10.—By the <i>Colon</i> —Cristobal:	
G. Amsinck & Co.	15,870
Mecke & Co.	15,180
I. S. Sembrada & Co.	7,360
Pablo Calvet & Co.	13,110
A. M. Capen's Sons.	28,060
D. C. Andrews & Co.	10,580
Muller, Schall & Co.	690
Piza, Nephews & Co.	690
Gontard & Co.	2,300
M. A. de Leon & Co.	13,800
	107,640

JANUARY 13.—By the <i>Crown of Navarre</i> —Ciudad Bolivar:	
General Export & Commission Co.	26,000
American Trading Co.	3,360
Yglesias, Lobo & Co.	8,400
	37,760

JANUARY 18.—By the <i>Advance</i> —Cristobal:	
Isaac Brandon & Bros.	1,840
C. E. Griffin.	8,510
Fidanque Bros. & Co.	9,890
	20,240

JANUARY 22.—By the <i>Pastores</i> —Bocas del Toro:	
Gontard & Co.	7,820
H. Marquardt & Co.	8,050
Eggers & Heinlein.	230
	16,100

JANUARY 23.—By the <i>Panama</i> —Cristobal:	
I. S. Sembrada & Co.	10,200
G. Amsinck & Co.	5,000
A. M. Capen's Sons.	3,100
Pottberg, Ebeling & Co.	11,000
M. A. De Leon & Co.	13,200
Piza, Nephews & Co.	650
Mecke & Co.	10,000
	53,150

JANUARY 23.—By the <i>Crown of Cordova</i> —Ciudad Bolivar:	
Yglesias, Lobo & Co.	19,000
Various	6,000
	25,000

JANUARY 25.—By the <i>Prinz Frederick Hendrik</i> —Paramaribo:	
R. Van Walterbeck.	2,200

JANUARY 25.—By the <i>Steinstad</i> —Guyanaquil:	
Otto Gerdaul.	300
Pottberg, Ebeling & Co.	4,800
M. A. De Leon & Co.	6,000
	11,100

CRUDE RUBBER ARRIVALS AT SEATTLE.

Consignee is given first, followed by shippers.
Figured 130 pounds net to the case.

PLANTATION.

TO SEATTLE.

DECEMBER 24.—By the steamer <i>Yokohama Maru</i> .	
W. R. Grace & Co.	
Sandilands Buttery & Co.	3,900

DECEMBER 26.—By the steamer <i>Tensho Maru</i> .	
The B. F. Goodrich Co.	
W. T. Easley.	427,180

Firestone Tire & Rubber Co.	
The Waterhouse Co.	194,480

W. R. Grace & Co.	
Penang Rubber Estate.	11,050
	632,710

JANUARY 22.—By the steamer <i>Empress of Russia</i> .	
Goodyear Tire & Rubber Co.	8,300
British Consul General.	
The Palmdulla R. Co.	700

TO AKRON.

JANUARY 1.—By the steamer <i>Tacoma Maru</i> .	
The B. F. Goodrich Co.	
W. T. Easley.	235,170

JANUARY 5.—By the steamer <i>Sado Maru</i> .	
Firestone Tire & Rubber Co.	
The Waterhouse Co.	150,150

JANUARY 5.—By the steamer <i>Manila Maru</i> .	
Firestone Tire & Rubber Co.	
The Waterhouse Co.	127,270

JANUARY 15.—By the steamer <i>Inaba Maru</i> .	
Firestone Tire & Rubber Co.	
R. T. Reid & Co.	7,410

TO SEATTLE.

JANUARY 15.—By the steamer <i>Inaba Maru</i> .	
Goodyear Tire & Rubber Co.	
Kennedy & Co.	1,950
W. R. Grace & Co.	
R. T. Reid & Co.	910
	2,860

POUNDS.	
JANUARY 18.—By the steamer <i>Gishun Maru</i> .	
Goodyear Tire & Rubber Co.	
Penang Rubber Estate.	19,500

TO AKRON.

JANUARY 18.—By the steamer <i>Gishun Maru</i> .	
The B. F. Goodrich Co.	
W. T. Easley.	670,800
Firestone Tire & Rubber Co.	
The Waterhouse Co.	304,460
R. T. Reid & Co.	23,500
	998,760

CUSTOM HOUSE STATISTICS.

PORT OF SAN FRANCISCO—NOVEMBER, 1916.	
IMPORTS:	
India rubber	1,866,782
Gutta Jelutong (Pontianak).	13,600
Rubber scrap	11,417
	1,891,799

EXPORTS:	
Reclaimed rubber	6,226
India rubber boots....pairs	515
India rubber shoes....pairs	16,171
Automobile tires	70,912
Other rubber tires	16,316
Beltting, hose, etc.	11,821
All other manufactures of india rubber	18,058
Total	\$131,032

PORT OF BOSTON—DECEMBER, 1916.	
IMPORTS:	
India rubber	127,913
Rubber scrap	43,869
Manufactures of india rubber	4,465
	171,782

EXPORTS:	
Rubber scrap	6,864
India rubber boots....pairs	35,391
India rubber shoes....pairs	162,819
Automobile tires	173
Beltting, hose, etc.	1,467
All other manufactures of india rubber	5,233
Total	\$157,549

PORT OF CHICAGO—DECEMBER, 1916.	
IMPORTS:	
Rubber scrap	173,898
Manufactures of india rubber	1,185
	173,898

PORT OF CLEVELAND—DECEMBER, 1916.	
IMPORTS:	
India rubber	544,770
Rubber scrap	75
Manufactures of india rubber	1,064
	544,845

PORTS OF DETROIT AND HURON—DECEMBER, 1916.	
IMPORTS:	
Gutta jelutong (Pontianak).	43,186
Rubber scrap	31,631
India rubber boots....pairs	891
India rubber shoes....pairs	252
Automobile tires	6,380
Other rubber tires	30
Beltting, hose, etc.	1,181
All other manufactures of india rubber	5,528
Total	\$18,585

PORT OF GALVESTON—DECEMBER, 1916.	
EXPORTS:	
Manufactures of india rubber	13,300

PORT OF NEW ORLEANS—DECEMBER, 1916.	
IMPORTS:	
India rubber	49,731
	\$21,401

PORT OF PHILADELPHIA—DECEMBER, 1916.	
EXPORTS:	
Other rubber tires....pairs	\$7,113
Beltting, hose, etc.	5,663
All other manufactures of india rubber	6,700
Total	\$19,476

PORTS OF SEATTLE AND TACOMA—DECEMBER, 1916.	
IMPORTS:	
India rubber	2,739,487
Gutta jelutong (Pontianak).	112,405
	2,851,892

EXPORTS:	
India rubber boots....pairs	708
India rubber shoes....pairs	1,994
Automobile tires	31,546
Other rubber tires	509
Beltting, hose, etc.	1,703
All other manufactures of india rubber	2,261
Total	\$39,766

IMPORTS AND EXPORTS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

Week Ending—	India Rubber		Scrap for Re-manufacture.		Balata.		Gutta Percha.		Gutta Jelutong.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
December 22, 1916.....	3,949,676	\$8,476*	353,799	\$23,910	52,068	\$25,002	.....	.....	.....	.....
December 29, 1916.....	4,278,006	2,245,079	33,289	288*	12,518	5,480	15,022	\$1,506	292,953	\$13,152
January 5, 1917.....	9,906,512	5,088,983	358,484	1,115*	55,085	27,075	27,000	3,113	1,339,898	58,088
January 12, 1917.....	4,927,107	2,588,419	78,325	3,763*	83,461	40,825	.....	51	.....	.....

*Manufactures of India Rubber. †Manufactures of Gutta Percha.

In addition to the above 103,632 pounds of chiclé was imported, valued at \$49,905.

EXPORTS.

FIGURES ISSUED FROM DECEMBER 26 TO JANUARY 25, 1917.

EXPORTED TO—	Belting, Hose and Packing.	Footwear.		Tires.		Insulated Wire and Cables.	Other mnfr. of India Rubber.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
		Boots.	Shoes.	Auto.	Other.						
NORTH AMERICA:											
Bermuda.....	\$37	\$19			\$90	\$89	\$320		\$232		
British Honduras.....							76		90		
Canada.....							2	\$79			
Central American States—											
Costa Rica.....	1,254			\$616	40	12	3,008		1,699		
Guatemala.....	993			8,183	163	941	548		752		
Honduras.....	11			619		100	1,502		18		
Nicaragua.....	17					384	1,224		20		
Panama.....	3,850	50	\$230	10,064	3,833	6,016	4,015	119	2,910		
Salvador.....	171			4,129	3,43	724	3,683		281		
Mexico.....	7,679			5,851	2,528	15,074	5,213	14	210	\$323	
Newfoundland.....	60	22,860	1,797	289		480	884	3	1,559		
West Indies—											
British—											
Barbados.....	141		6	853	892		299	49			
Jamaica.....	515	11	235	2,858	2,227	196	1,216		1		
Trinidad and Tobago.....	360	8		4,659	7	678	1,547				
Other British.....	407		283	1,985	803	800	555		8		
Cuba.....	20,987		517	36,026	3,409	80,119	20,310	4,764	1,402		
Danish.....	147		49	26			193	2	15		
Dutch.....	370			281	49		611	2	4		
French.....	324			586	427	167	22	4			
Haiti.....	111			52		46	598		40		
Santo Domingo.....	254		176	1,905	635	239	2,322	19	235		
Totals, North America...											
	\$37,877	\$22,948	\$3,293	\$78,982	\$15,107	\$106,065	\$48,148	\$5,063	\$9,476	\$323	
EUROPE:											
Denmark.....							\$769	\$268			
France.....	\$1,465	510	\$3,988	\$2,484	\$26,511	\$182,687	91,897	200	\$2,708		
Gibraltar.....							45				
Italy.....	524	2				4,894	2,148	2			
Netherlands.....						3,842					
Norway.....	5,685					39,293	1,543		264		
Portugal.....	3,042						109				
Russia in Europe.....						8,016	1,650				
Spain.....	1,148			973		1,903	2,778	1,651			
Sweden.....						12,436					
Switzerland.....						1,420					
United Kingdom—											
England.....	46,318	8,757	11,404	412,670	535,170	119,394	186,428	348	42,480	\$3,600	\$4,422
Scotland.....	12,765						56		6,000		12,531
Totals, Europe.....											
	\$70,947	\$9,269	\$15,392	\$416,127	\$561,681	\$373,885	\$287,423	\$2,469	\$51,452	\$3,600	\$16,953
SOUTH AMERICA:											
Argentina.....	\$14,111		\$779	\$127,701	\$13,260	\$21,871	\$15,598		\$108		
Bolivia.....	94			1,046	53		283	\$120			
Brazil.....	8,085		1,443	73,778		25,148	11,692		119		
Chile.....	15,324		230	9,561	239	18,826	10,144		294		\$759
Colombia.....	1,016		322	2,513	400	5,373	2,643	149			
Ecuador.....	944		199	1,008		441	3,044	4	222		
Guiana—British.....	344		366	1,615	154	34	138				
Dutch.....	41			510	18		55				
French.....				5			13	9			
Paraguay.....							39				
Peru.....	6,627	1,039		766	242	2,864	5,634	186	1,279		
Uruguay.....	2,064		1,025	4,038	500	7,860	3,308				
Venezuela.....	1,228		52	12,887	1,803	1,484	5,853				
Totals, South America...											
	\$49,878	\$1,039	\$4,416	\$235,428	\$15,869	\$83,901	\$58,439	\$468	\$2,022		\$759
ASIA:											
China.....	\$773		\$93			\$8,216	\$458	\$70	\$40		
British India.....	385			\$16,025	1,709	1,338	1,019	241	362		
Straits Settlements.....	10		55	598	94		81				
Dutch East Indies.....				980		77,449	7				
French East Indies.....							130				
Hongkong.....							122				
Japan.....	883		332			4,076	2,513			993	
Total Asia.....											
	\$2,051		\$480	\$17,603	\$1,803	\$91,079	\$4,330	\$311	\$402	\$993	
OCEANIA:											
British—											
Australia and Tasmania.....	\$2,685	\$912	\$7,315	\$30,726	\$6	\$3,222	\$6,199		\$1,061		
New Zealand.....	391	1,835	913	2,098		211	1,154		119		
Philippine Islands.....	4,656			1,691		1,694	2,446		200		
Totals, Oceania.....											
	\$7,732	\$2,747	\$8,228	\$34,515	\$6	\$5,127	\$9,799		\$1,380		
AFRICA:											
British Africa—											
West.....			\$10	\$146			\$9				
South.....	\$25,127	\$2,417	1,817	26,144	\$1,100	\$421	7,213		\$1,077		
East.....				3,732			251				
Canary Islands.....								\$16			
Madagascar.....			5								
Italian Africa.....				174							
Portuguese Africa.....	1,784						28				
Totals, Africa.....											
	\$26,911	\$2,417	\$1,832	\$30,196	\$1,100	\$421	\$7,501	\$16	\$1,077		

In addition to the above the following items were exported during the same period: To England—Balata, \$31,673; India Rubber, \$1,210; to Scotland—Balata, \$54,099; to Santo Domingo—India Rubber, \$98.

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—free:	November, 1916.	
	Pounds.	Value.
India rubber:		
From—		
France	152,636	\$63,804
Portugal		
United Kingdom	5,289,168	2,870,357
Central America and British Honduras	77,990	32,402
Mexico	144,246	64,993
Brazil	3,975,007	1,927,109
Other South America	253,580	110,840
East Indies	9,644,480	5,020,279
Other countries	10,156	4,757
Totals	19,547,263	\$10,094,541
Balata	250,374	143,114
Guayule gum	144,090	32,295
*Gutta jelutong	1,265,829	89,442
Gutta percha	4,437	582
Totals	21,511,993	\$10,359,974
Rubber scrap	1,670,864	102,581
Totals, unmanufactured	23,182,857	\$10,462,555
Chicle	575,905	\$293,672
MANUFACTURED—dutiable:		
Gutta percha		\$1,037
India rubber		71,950
Totals, manufactured		\$72,987
Substitutes—elasticon, etc.		\$2,085

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	November, 1916.	
	Pounds.	Value.
Automobile tires:		
To—		
England		\$393,547
Canada		46,338
Mexico		17,168
Cuba		56,123
Australia		24,537
New Zealand		25,199
Philippine Islands		29,805
Other countries		351,662
Total		\$944,379
All other tires		128,716
Belting, hose and packing		217,370
Rubber boots		438,781
Rubber shoes		252,866
Scrap and old rubber		46,351
Reclaimed rubber		59,171
Other rubber manufactures		655,676
Totals, manufactured		\$2,743,310
Fountain pens	14,462	\$10,786

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—	November, 1916.	
	Pounds.	Value.
Balata	26,689	\$14,143
Guayule gum		
Gutta jelutong		
Gutta percha		
India rubber	421,570	250,656
Rubber scrap and refuse		
Totals, unmanufactured	448,259	\$264,799
Chicle	3,462	\$1,133

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

MANUFACTURED—	November, 1916.	
	Quantity.	Value.
To—		
Alaska:		
Belting, hose and packing	6,062	\$5,852
Boots and shoes		9,575
Other rubber goods		1,789
Totals	6,062	\$17,216
To—		
Hawaii:		
Belting, hose and packing		\$7,709
Automobile tires		44,026
Other tires		5,891
Other rubber goods		21,345
Total		\$78,971
To—		
Philippine Islands:		
Belting, hose and packing		\$9,287
Boots and shoes	33,980	24,244

Tires	34,586
Other rubber goods	9,926
Total	33,980

To—	
Porto Rico:	
Belting, hose and packing	\$8,421
Automobile tires	53,428
Other tires	750
Other rubber goods	9,842
Total	\$72,441

* Dutiable beginning July 1, 1916.

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—free:	October, 1916.	
	Pounds.	Value.
Rubber and gutta percha, crude caoutchouc or india rubber:		
From—		
Great Britain	399,537	\$220,092
United States	260,941	132,589
Straits Settlements	94,895	53,524
Totals	755,373	\$406,205
Rubber, recovered:		
Great Britain	200	\$49
United States	260,337	46,406
Totals	260,537	\$46,455
Hard rubber, in sheets and rods:		
United States	829	\$774
Rubber substitute:		
United States	67,663	\$6,773
Rubber, powdered, and rubber or gutta percha waste:		
Great Britain	147,240	\$5,908
United States	83,786	4,219
Other countries	3,603	266
Totals	234,629	\$10,393
Rubber thread, not covered:		
United States	1,912	\$2,968
Balata, crude:		
United States	4,648	\$3,764
Chicle, crude:		
United States	292,218	\$99,277
British Honduras	248,958	89,418
Mexico	216,788	77,685
Totals	757,964	\$266,380

MANUFACTURED—dutiable:	October, 1916.	
	General Tariff.	Pref-erential Tariff.
Boots and shoes:		
From—		
United States	\$15,241	
Belting:		
United States	\$5,584	
Waterproof clothing:		
Great Britain		\$38,046
United States	\$12,189	
Totals	\$12,189	\$38,046
Hose, lined with rubber:		
Great Britain		\$59
United States	\$10,520	
Totals	\$10,520	\$59
Mats and matting:		
United States	\$202	
Packing:		
Great Britain		\$7
United States	\$6,001	
Totals	\$6,001	\$7
Tires of rubber for all vehicles:		
Great Britain	\$11,970	\$379
United States	126,861	
France	643	
Totals	\$139,474	\$379

Rubber cement and all other manufactures of india rubber and gutta percha, N. O. P.:		
Great Britain	\$550	\$11,323
United States	52,415	
Other countries	83	
Totals	\$53,048	\$11,323
Webbing—over one inch wide:		
Great Britain		\$1,241
United States	\$22,145	
Totals	\$22,145	\$1,241

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

October, 1916.

MANUFACTURED—	Produce of Canada.	Value.	Reexports of Foreign Goods.	Value.
Hose:				
To—				
Great Britain	\$4,095			
Newfoundland	322			
Other countries	13,370			
Totals	\$17,787			

Boots and shoes:		
To—		
Great Britain	\$102,096	
United States	231	
Newfoundland	29,363	
Australia	1,572	
New Zealand	3,389	
Other countries	1,318	
Totals	\$137,969	

Tires:		
To—		
Great Britain	\$39,710	
United States	2,090	\$1,042
Other countries	9,179	
Totals	\$50,979	\$1,042

* Rubber waste:		
To—		
United States	\$22,875	
All other manufactures, N. O. P.:		
To—		
Great Britain	\$6,512	
United States	196	\$512
Newfoundland	150	
New Zealand	592	
Other countries	292	
Totals	\$7,742	\$512

† Gum chicle:		
United States	\$231,147	

* During October 313,700 pounds of rubber waste was exported to the United States.
† During October 425,746 pounds of gum chicle was exported to the United States.

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

Nine Months Ending September, 1916.

—raw and reclaimed:		
From—		
Great Britain	2,937,660	*****
Straits Settlements	1,150,820	*****
African French Colony...	6,380	*****
Belgian Congo	219,120	*****
Brazil	3,767,060	*****
Other countries	1,249,600	*****
	<hr/>	
Totals	9,330,640	\$6,548,413
Rubber scrap	5,280,440	\$416,915

MANUFACTURED—		
India rubber and gutta percha		
—threads:		
From—		
United States	45,100	.....
Great Britain	26,620	.....
Other countries	6,600	.....
Totals	78,320	\$137,416

India rubber and gutta percha—sheets:		
Cut sheets	3,520	\$5,250
Elastic fabric	1,760	695
Insulated wire	440	116
Hard rubber	27,940	19,609

India rubber and gutta percha—tubes:		
Cut sheets	1,100	\$1,737
Elastic fabric	220	
Other countries	10,340	
Totals	10,560	\$5,558

Other forms	6,160	3,783
Belting	101,420	47,281
Rubber coated fabrics, pieces	97,020	119,158

Boots and shoes—pairs:		
United States	23,294	
France	10,291	
Other countries	152	
Totals	33,737	\$32,556

Elastic webbing:		
France	25,740	
Germany	880	
Other countries	24,200	
Totals	50,820	\$67,914

Elastic fabric—not specified:	Pounds.	Value.	MANUFACTURED—	Pounds.	Value.	Elastic fabric—not specified:	Pounds.	Value.
From—			India rubber and gutta percha			To—		
France	217,580	.....	—threads:			Spain	440	.....
Great Britain	106,920	.....	To—			Argentina	22,000	.....
Other countries	8,140	.....	France	7,700	.....	Brazil	220	.....
Totals	332,640	\$262,634	Great Britain	9,900	.....	Uruguay	1,760	.....
Tires:			Argentina	3,740	.....	Other countries	12,100	.....
From—			Other countries	23,760	.....	Totals	36,520	\$64,076
France	1,162,260	.....	Totals	45,100	\$81,110	Tires:		
Great Britain	374,660	.....	India rubber and gutta percha			To—		
Other countries	28,160	.....	—sheets:			France	258,280	.....
Totals	1,565,080	\$2,746,684	Cut sheets	4,840	\$7,218	Great Britain	3,268,100	.....
Other rubber manufactures:			Elastic fabric	2,200	829	Switzerland	66,880	.....
From—			Insulated wire	880	232	India and Ceylon	353,540	.....
United States	1,323,960	.....	Hard rubber	24,000	30,880	Australia	79,200	.....
France	897,160	.....	India rubber and gutta percha			Argentina	843,040	.....
Great Britain	749,760	.....	—tubes:			Brazil	455,180	.....
Other countries	1,100	.....	Cut sheets	11,000	\$17,370	Other countries	459,580	.....
Totals	2,971,980	\$2,085,790	Elastic fabric	95,040	50,026	Totals	5,783,800	\$10,148,940
Total Imports		\$12,502,509	Other forms	99,880	61,335	Other rubber manufactures:		
EXPORTS OF CRUDE AND MANUFACTURED RUBBER.			Belting	1,540	946	To—		
UNMANUFACTURED—			Boots and shoes	2	2	Great Britain	49,060	.....
India rubber and gutta percha			Elastic webbing:			Switzerland	47,300	.....
—raw and reclaimed....			To—			Argentina	82,940	.....
Nine Months Ending			France	7,260	.....	Other countries	183,040	.....
September, 1916.			Greece	90,860	.....	Totals	362,340	\$254,297
Pounds.	Value.		Egypt	20,900	.....	Total Exports		\$11,648,920
833,140	\$292,346		Argentina	92,840	.....		
			Brazil	89,540	.....		
			Cuba	28,160	.....		
			Other countries	156,860	.....		
			Totals	486,420	\$639,313			

THE MARKET FOR COTTON AND OTHER FABRICS.

Copyright 1917

NEW YORK.

AMERICAN COTTON. The January cotton market has been steady compared to the violent fluctuations of last December. The speculative markets are apparently not so sensitive to conflicting rumors of peace and international complications as they were a month ago. It is generally believed that the present level of prices will continue until the market is again affected by new crop reports or trade disturbances. There are, moreover, certain interests that predict a return of 20-cent cotton before spring, but two important bull movements are hardly to be expected in one season. On January 4, middling spot cotton was selling at 17.55 cents and reached 17.80 cents on January 8. After minor fluctuations in the interim, spot cotton was quoted at 17.40 cents on January 29.

EGYPTIAN COTTON. Reports by mail from Alexandria under date of December 15, 1916, indicate that the reaction from the advance which commenced early in the season has resulted in a weaker market and prices have declined. The spot market has been very irregular. Sakellarides is becoming scarce and full prices are being paid for spot lots. The demand for uppers has not weakened and prices have remained steady.

The exports of Egyptian cotton from Alexandria for the period September 1, 1915, to August 31, 1916, were 728,319 bales, approximating 800 pounds. The United States imported 184,544 bales; England, 355,699; Spain, 20,332; France, 45,812; Japan, 25,801; Italy, 52,516; Russia, 42,619; India, Portugal and Greece, 1,026.

SEA ISLAND COTTON. Quiet has prevailed in the southern markets during the past month and prices have remained practically unchanged. There has apparently been a fair amount of inquiries but the volume of actual business has been small. The crop in sight at all ports on January 19 was 69,727 bales against 61,372 bales for the same period a year ago.

TIRE FABRICS. Business continues good with numerous price inquiries for contracts covering the last half of 1917. The fabric mills are sold until the middle of next summer and this year will doubtless show a marked increase in production.

It is estimated that 115,000,000 pounds of building fabric went into the manufacture of tires during the season of 1915-16. Of this amount Egyptian fabric furnished 75,000,000 pounds; Sea Island fabric, 30,000,000 pounds; Long staple (American) Peellers fabric, 5,000,000 pounds; Sea Island and Egyptian Cord fabrics, 5,000,000 pounds. The amount of tire building fabric required for 1917 is estimated at 141,000,000 pounds.

MECHANICAL DUCK. The undertone of the market is easier

and prices have eased off about a cent a pound. There is a good domestic demand for this time of the year, the mills are behind on orders and supplies are not over-plentiful. The slump in cotton had little effect on the spot market but resulted in easier futures. The situation may be said to be generally easier.

SHEETINGS AND DRILLS. Wide sheetings, drills and twills continue to be in good demand, 50 and 52-inch particularly. Prices are firm and have not changed since a month ago.

RAINCOAT CLOTH. Business has been quiet, due to the weather and the fact that January is usually a quiet between-season month. Prospects of a good Spring business in raincoat cloth are indicated by the numerous inquiries being received at this time.

NEW YORK QUOTATIONS.

JANUARY 26, 1917.

Prices subject to change without notice.

Airplane and Balloon Fabrics:			
Wamsutter, S. A. I. L. No. 1, 40-inch.....	yard	\$0.35	@
No. 4, 38½-inch.....		.35	@
Wool Stockinettes—52-inch:			
A—14-ounce	yard	1.38	@
B—14-ounce		1.65	@
C—14-ounce		1.92	@
Cotton Stockinettes—52-inch:			
D—14-ounce	yard	.55	@ .60
E—11½-ounce .....		.46	@ .55
F—14-ounce .....		.60	@ .65
G—8-ounce .....		.52	@ .55
H—11-ounce .....		.55	@ .60
I—9-ounce .....		.46	@ .50
Colors—white, black, blue, brown.			
Knitbac Stockinette	lb.	1.00	@ 1.05
Tire Fabrics:			
17½-ounce Sea Island, combed.....	square yard	1.25	@ 1.35
17½-ounce Egyptian, combed.....		1.10	@ 1.15
17½-ounce Egyptian, carded		1.07	@ 1.12
17½-ounce Peellers, carded .....		.70	@
Sheeting:			
40-inch 2.35-yard	yard	.15½	@
40-inch 2.50-yard .....		.14½	@
40-inch 2.70-yard .....		.14	@
40-inch 2.85-yard .....		.13	@
40-inch 3.15-yard .....		.12½	@
Osnaburgs:			
40-inch 2.25-yard	yard	.16½	@
40-inch 2.48-yard .....		.15	@
37½-in. 2.42-yard .....		.15½	@
Mechanical Ducks:			
Hose	pound	.37	@ .38
Belting .....		.36	@ .37
Carriage Cloth Duck:			
38-inch 2.00-yard enameling duck.....	yard	.20	@
38-inch 1.74-yard .....		.43½	@
72-inch 16.66-ounce .....		.45	@
72-inch 17.21-ounce			
Drills:			
38-inch 2.00-yard	yard	.19	@
40-inch 2.47-yard .....		.15½	@
52-inch 1.90-yard .....		.20½	@
52-inch 1.95-yard .....		.20	@
60-inch 1.52-yard .....		.26½	@
Yarns:			
Garden Hose, 12/2 cabled.....	pound	Nominal	
Fire Hose 12/1		Nominal	
Imported Woolen Fabrics Specially Prepared for Rubberizing—Plain and Fancies:			
63-in, 3¼ to 7½ ounces.....	yard	.38	@ 1.55
36-inch, 2¼ to 5 ounces .....		.35	@ .85

Imported Plaid Lining (Union and Cotton):			
63-inch, 2 to 4 ounces.....	yard	.35	@ .75
36-inch, 2 to 4 ounces.....	yard	.25	@ .50
Domestic Worsted Fabrics:			
36-inch, 4½ to 8 ounces.....	yard	.35	@ .65
Domestic Woven Plain Linings (Cotton):			
36-inch, 3¼ to 5 ounces.....	yard	.10	@ .18
Raincoat Cloth (Cotton):			
Bombazine.....	yard	.08	@ .09½
Twills.....	yard	.12	@ .18
Tweed.....	yard	.25	@ .35
Tweed, printed.....	yard	.07½	@ .15
Plaid.....	yard	.08½	@ .10
Repp.....	yard	.24	@ .27
Burlaps:			
22-7½-ounce.....	100 yards	7.00	@
40-7½-ounce.....	100 yards	8.15	@
40-8-ounce.....	100 yards	8.25	@
40-10-ounce.....	100 yards	9.40	@
40-10½-ounce.....	100 yards	9.65	@
45-7½-ounce.....	100 yards	9.40	@

SEA ISLAND CROP MOVEMENT

FROM AUGUST 1 TO DECEMBER 29, 1916.

	Receipts 1916-17	Receipts 1915-16
Stock on hand, August 1, 1916—		
Savannah, 2,401; Charleston, 107.....	bales 2,508	2,382
Received at Savannah (Gross).....	37,150	32,786
Received at Charleston.....	2,586	3,814
Received at Jacksonville.....	27,701	19,025
Totals.....	69,945	58,007
Less Exports.....	58,724	40,396
Stock December 29, 1916—		
Savannah, 9,431; Charleston, 1,790.....	bales 11,221	17,611
Crop in sight at all ports to date.....	67,377	55,625

EXPORTS.

From—	Great Britain.	Continent.	Northern Mills.	Southern Mills.	Totals.
Savannah.....	889	120	25,739	3,372	30,120
Charleston.....	...	...	903	...	903
Jacksonville.....	...	...	27,701	...	27,701
Totals.....	889	120	54,343	3,372	58,724
1915-16.....	150	1,060	36,537	2,649	40,396

In addition to the above movement, a large quantity of cotton has gone direct to Southern mills from interior points, and to Northern mills via Norfolk. While the exact figures are not available at present, it is conservatively estimated that the total amount of cotton so shipped is somewhere in the neighborhood of 12,000 bales.
(Compiled by John Malloch & Co., Savannah, Georgia.)

EGYPTIAN COTTON CROP MOVEMENT.

FROM AUGUST 1 TO DECEMBER 27, 1916.

To—	1916-1917.	1915-1916.	1914-1915.
Liverpool.....	bales 111,483	120,235	63,639
Manchester.....	74,319	65,948	58,737
Total shipments to Great Britain.....	185,802	186,183	122,376
To—			
France.....	12,102	17,117	15,143
Spain.....	5,015	21,995	53,708
Italy.....	35,258	19,764	11,920
Switzerland.....	6,737	50	1,071
Russia.....	13,046	65	...
Greece.....	65	...	...
Total shipments to Continent.....	52,223	61,932	81,842
To—			
United States of America.....	50,756	94,944	52,741
India.....	4,320	9,205	3,963
Japan.....	4,320	...	...
Total shipments to all parts.....	293,101	352,264	260,922
Total Crop (interior gross weight) cantars.....	4,726,518	6,473,726	...

THE MARKET FOR RUBBER SCRAP.

Copyright 1917.

NEW YORK.

THERE has been very little interest shown in the rubber scrap market during the past month. The volume of actual business transacted has been small and the large buyers have been conspicuously absent. January is the season of the year when supplies are usually allowed to diminish in view of annual stock taking. Moreover, the difficulties attending railroad shipments have had a marked effect in depressing the general business situation. The easier tone of the market is therefore explained and the softening of prices is only a natural result of the prevailing adverse conditions. The continued activity of the rubber mills and reclaimers affords the belief that supplies have been greatly reduced and active buying will not be long deferred. Generally

speaking, prices have undergone comparatively few changes during the month and with few exceptions the revision was downward.

BOOTS AND SHOES. This has been the weakest material on the list and prices have declined ¼ to ¼ cent. Consumers have consistently refused to buy at the prevailing prices with the expectation of lower values. Trimmed and untrimmed arctics were easy, and despite minor fluctuations, prices are the same as quoted a month ago.

AUTO TIRES. The situation in tires has been devoid of interest and prices have eased off accordingly. G. & G. white tires are ¼ cent lower than a month ago. Bicycle and solid tires were dull and unchanged.

INNER TUBES. There has been little doing in tubes and business has been limited to small orders as buyers are confident of securing better figures. The quiet conditions ruling in the crude rubber market doubtless explains the easy position of tubes. Prices have fluctuated during the month but are now about the same as a month ago.

London imports of waste and reclaimed rubber for December were 78,100 pounds, and Liverpool 179,400 pounds, as compared to 109,300 and 20,100 pounds, respectively, for November. Exports for December were as follows: London, 1,158,900 pounds; Liverpool, 303,200 pounds, as compared to 1,244,000 and 106,800 pounds for November.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

JANUARY 25, 1917.

Prices subject to change without notice.

	Per Pound.
Boots and shoes.....	\$0.09¼ @ .09¼
Trimmed arctics.....	.07¾ @ .07¾
Untrimmed arctics.....	.06¼ @ .06¼
White tires, Goodrich and Goodyear.....	.08 @ .08¼
Auto tires, standard white.....	.06¾ @ .06¾
standard mixed.....	.06¾ @ .06¾
stripped, unguaranteed.....	.04¼ @ .05
Auto peelings, No. 1.....	.09¼ @ .09¼
No. 2.....	.08¼ @ .08¼
Inner tubes, No. 1.....	.25¼ @ .26
No. 2.....	.11¼ @ .11¼
red.....	.02¼ @ .02¼
Irony tires.....	.04¼ @ .04¾
Bicycle tires.....	.05¼ @ .06
Solid tires.....	.13¼ @ .14
White scrap, No. 1.....	.10 @ .10
No. 2.....	.10 @ .11
Red scrap, No. 1.....	.08 @ .08
No. 2.....	.04 @ .04
Mixed black scrap, No. 1.....	.04¼ @ .04¼
No. 2.....	.04¼ @ .04¼
Rubber car springs.....	.01 @ .01¼
Horse shoe pads.....	.01¼ @ .01¼
Mattings and packings.....	.01 @ .01¼
Garden hose.....	.05¼ @ .05¼
Air brake hose.....	.02¼ @ .02¼
Cotton fire hose.....	.01¼ @ .01¼
Large hose.....	.26 @ .26
Hard rubber scrap, No. 1, bright fracture.....	.02¼ @ .02¼
Battery jars (black compound).....	.03¼ @ .03¼
Insulated wire stripping.....	.03¼ @ .03¼
Rubber heels.....	.03¼ @ .03¼

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

Copyright, 1917.

NEW YORK.

THE demand for rubber chemicals and ingredients during the past month has been exceedingly active. The dealers report unprecedented business in rubber materials, and the many inquiries received indicate that it will continue. Ocean rates are abnormally high. Only limited space is obtainable at \$40 to \$60 a ton, the rate normally being \$7.50 to \$10 a ton. The heavy export demand has reduced stocks of many ingredients, and resulted in advanced prices. Imports have been seriously affected, due to well-known shipping difficulties, and the recent British requisition of 85 per cent of the cargo space will further complicate trade with neutral Europe. There is every reason to believe a protective tariff will eventually be levied on all rubber chemicals imported into England.

CARBON GAS BLACK. The heavy export demand has exhausted all stocks in sight, and prices have advanced 5 cents a pound.

Producers have sold their output and the dealers control the spot market. Contract deliveries have been called for promptly.

CARBON TETRACHLORIDE. There has been active call for this solvent, and spot supplies have been heavily drawn on during the past month. Prices show a gain of 2 cents a pound.

CARBONATE OF MAGNESIA. The steady demand from European and domestic sources has developed a strong market, exports to France being particularly heavy. Producers are reported to be well sold up. Sales have been reported around 12 to 13 cents.

OXIDE OF IRON. The pure, bright grades have been scarce and business restricted, due to the continued heavy demand. Supplies have been limited, orders held up and the producers are unwilling to increase production to meet the requirements of abnormal conditions. Prices have advanced 3 cents a pound since our last report.

SHELLAC. A marked advance was noted early in the month, due to reports that exports from India will be prohibited. The market became easier, however, at the close of the month.

WHITING. The difficulties of securing the raw material have apparently increased. English cliffstone is almost impossible to obtain. The demand has continued to be active, and prices have advanced. The domestic producers are making every effort to meet the demand, but are unable to relieve the situation.

ZINC OXIDE. Contract deliveries have been insistently called for during the past month, indicating the strong position of this market. The speculation market on American process qualities has advanced 1 to 1½ cents, but there is only a limited supply offered at 11 to 11½ cents.

NEW YORK QUOTATIONS.

JANUARY 23, 1917.

Subject to change without notice.

Accelerene	lb.	Nominal
Acetone (drums)	lb.	\$0.22 @ 0.24
Acid, acetic, 28 per cent. (bbls.)	lb.	.04½ @ .05
cresylic (crude)	gal.	1.00 @
glacial, 99 per cent (carboys)	lb.	.30 @ .40
muriatic, 20 degrees	lb.	.01¾ @
nitric, 36 degrees	lb.	.05½ @
sulphuric, 66 degrees	lb.	.01½ @ .02
Alumina, Tosio (carloads)	ton	19.00 @
Aluminum Flake (carloads)	ton	20.00 @ 22.00
Ammonium carbonate	lb.	.11½ @
Antimony, crimson, sulphuret of (casks)	lb.	.50 @ .65
crimson, "Magmetco"	lb.	Nominal
crimson, "Mephisto" (casks)	lb.	.50 @
golden, sulphuret of (casks)	lb.	.27 @ .35
golden, "Magmetco"	lb.	Nominal
golden, "Mephisto"	lb.	.25 @
golden, sulphuret, States brand, 16-17 per cent. lb.	lb.	.23 @
red sulphuret, States brand	ton	17.50 @ 20.00
Asbestine	ton	20.00 @ 40.00
Asbestos	ton	.02 @ .02½
Asphaltum "G" Brilliant	lb.	.04¾ @
Barium sulphate, precipitated	lb.	30.00 @ 32.50
Barytes, pure white	ton	15.00 @ 20.00
off color	ton	100.00 @
Basofo	ton	.60 @
Benzol, pure	gal.	1.00 @
Beta-Naphthol	lb.	.04 @ .06
Brown, sienna, raw powdered	lb.	.03 @ .03½
Bumbar, raw powdered	lb.	Nominal
Bone ash	lb.	.04 @ .08
black	lb.	Nominal
Cadmium tri-sulphate (f. o. b. London)	lb.	2.25 @
sulphide, yellow	lb.	.33 @
Cantella gum	lb.	.05½ @
Carbon, bisulphide (drums)	lb.	.20 @ .30
black (cases)	lb.	.18 @ .20
tetrachloride (drums)	lb.	.04¾ @
Caustic soda, 76 per cent.	lb.	.04½ @ .05½
Chalk, precipitated, extra light	lb.	.03¾ @ .05
precipitated, heavy	ton	16.00 @
China clay, domestic	ton	60.00 @
imported	ton	.37 @ .45
Chrome, green	lb.	.24 @ .28
yellow	lb.	.08 @
Cotton linters	lb.	.85 @ .90
Excellerex	lb.	.03½ @
Fossil flour	lb.	.30 @
Gas black	lb.	40.00 @
Gilsonite	ton	.40 @ .60
Glue, high grade	lb.	.30 @ .40
medium	lb.	.18 @ .30
low grade	lb.	.53 @
Glycerine, C. P. (drums)	lb.	.20 @
Graphite, flake (400 pound bbl.)	lb.	.07 @
powdered (400 pound bbl.)	lb.	.75 @ .85
Green oxide of chromium (casks)	lb.	.02¾ @
Ground glass (fine)	lb.	.65 @
Hexamethylene Tetramine	lb.	.04½ @ .07½
Indian red, reduced grades	lb.	.08½ @
pure	ton	60.00 @
Infusorial earth, powdered	ton	65.00 @
bolted	ton	

Iron oxide, red, reduced grades	lb.	.02¾ @ .03¾
red, pure, bright	lb.	.10 @ .13
Ivory, black	lb.	.12 @ .15
Lampblack	lb.	.09¼ @
Lead, red oxide of	lb.	.08¼ @
sublimed blue	lb.	.08¼ @
sublimed white	lb.	.08¼ @
white, basic carbonate	lb.	.08¼ @
white, basic sulphate	lb.	.45 @ .75
black hyposulphite (Black Hypo)	lb.	.01¼ @ .01½
Lime, flour	lb.	.09¼ @ .09¾
Litharge	lb.	.11½ @ .12
sublimed	lb.	.09¼ @
Lithopone, imported	lb.	.14½ @
domestic	lb.	.07 @
Beckton white (carloads)	lb.	Nominal
Magnesia, carbonate	lb.	.11 @ .15
calcined, heavy	lb.	.09¼ @ .10¼
heavy, Thistle Brand	lb.	.12 @
light	lb.	.65 @
Magnesite, calcined, powdered	ton	35.00 @ 39.00
Mineral rubber	lb.	.05 @ .06½
"M. R. X."	ton	.01 @ .02
"Genasco" (carloads)	ton	100.00 @
"L. M. R."	ton	37.00 @
"Richmond Brand"	ton	57.50 @
"No. 64 Brand"	ton	.03 @
"Refined Elaterite"	ton	35.00 @
Rubrax	ton	.05 @
Naphtha, stove gasoline (steel bbls.)	gal.	32.50 @
66@68 degrees (steel bbls.)	gal.	.22 @
68@70 degrees (steel bbls.)	gal.	.27 @
V. M. & P. (steel bbls.)	gal.	.28 @
Oil, aniline	lb.	.21 @
corn, refined (Argo)	cut.	.23 @ .25
linseed (bbl.)	gal.	12.76 @
palm	gal.	.93 @
paraffin	gal.	.12 @ .12½
pine (cases)	gal.	.17 @
rapeseed	gal.	.65 @
rosin, heavy body	gal.	1.00 @ 1.05
tar (cases)	gal.	6.75 @
soluble aniline colors, yellow, orange, red, violet, blue, green	lb.	.21½ @
Orange mineral, domestic	lb.	5.00 @ 15.00
Paragol (carloads)	cut.	.12 @
Petrolatum	lb.	10.54 @
Petroleum grease	lb.	.06½ @
Pine solvent	lb.	.04¼ @
Pitch, burgundy	bbl.	None
coal tar	bbl.	8.50 @
pine tar	bbl.	.03¼ @ .04
Plaster of paris	lb.	4.50 @
Prussian blue	lb.	9.35 @
Fumice stone, powdered (bbls.)	lb.	1.50 @ 1.70
Resin, Pontianak, refined	lb.	.80 @
granulated	lb.	.03 @
fused	lb.	None
Rosin (280 pound bbls.)	bbl.	6.50 @ 8.50
Rotten stone, powdered	lb.	.02¾ @ .04
Rubber black	lb.	.06 @
Rubber substitute, black	lb.	.08½ @ .12½
white	lb.	.13½ @ .17
brown	lb.	.12½ @ .17
Rubhide	lb.	.35 @
Shellac, fine orange	lb.	.47 @ .50
Silex (silica)	ton	25.00 @ 35.00
Soapstone, powdered	ton	22.50 @ 30.00
Starch, corn, powdered	lb.	.04 @ .04½
Sulphur chloride (drums)	lb.	.08 @ .09¼
Sulphur, flour, velvet, brand (carloads)	cut.	2.20 @
Bergenport, pure soft brand	cut.	2.20 @
Talc, American	ton	11.50 @ 15.00
French	ton	22.50 @ 30.00
Tolmol, pure	gal.	1.75 @
Tripolite earth, powdered	ton	60.00 @
bolted	ton	65.00 @
Turpentine, pure gum spirits	gal.	.55 @
wood	gal.	.53 @
Venice	gal.	.11 @ .12
Ultramarine blue	lb.	.15 @ .50
Vermilion, brilliant	lb.	.20 @ .25
Chinese	lb.	.95 @ 1.00
English	lb.	1.30 @ 1.35
Wax, beeswax, white	lb.	.47 @ .60
ceresin, white	lb.	.12 @ .20
carnauba	lb.	.35½ @ .55
ozokerite, black	lb.	.60 @ .65
green	lb.	.75 @ .80
montan	lb.	.28 @ .30
paraffin, refined	lb.	.08 @
118/120 m. p. (cases)	lb.	.08½ @
123/125 m. p. (cases)	lb.	.09½ @
128/130 m. p. (cases)	lb.	.11 @
133/136 m. p. (cases)	lb.	.11 @
crude, white, 117/119 m. p. (bbls.)	lb.	Nominal
yellow, 124/126 m. p. (bbls.)	lb.	.07 @
Whiting, Alha	cut.	.75 @ .95
commercial	cut.	.85 @ .95
silders	cut.	.90 @ 1.15
Paris, white, American	cut.	1.20 @ 1.25
English cliffstone	cut.	1.50 @ 1.75
Wood pulp XXX (carloads)	ton	Nominal
Yellow ochre (Satin)	lb.	.02½ @
india rubber	lb.	1.50 @
Zinc oxide, American process, horsehead brand	lb.	.10½ @
"special"	lb.	.10 @
"XX red"	lb.	.10 @
French process, green seal. f. o. b. factory	lb.	.18½ @
red seal. f. o. b. factory	lb.	.17½ @
white seal. f. o. b. factory	lb.	.18½ @
Zinc substitutes	ton	25.00 @
Zinc sulphide, pure	lb.	.07 @



Vol. 55

FEBRUARY 1, 1917

No. 5

TABLE OF CONTENTS.

Editorials:	Pages.
The Rubber Association of America.....	247
Rubber Tariffs of the Future.....	247
The Rubber Industry and Conservation of Natural Resources.....	247-248
A Monument to the Inventor of the Pneumatic Tire.....	248
Minor Editorials.....	248
Rubber Club's Seventeenth Annual Banquet.. Illustration of Banquet and Portraits of Speakers.....	249-253
Members and Guests Present.....	253-255
Rubber Club's Annual Meeting.. Portraits of Officers and Directors.....	256-260
American Competition in Tires Resented.....	260
Automobile Shows, New York.....	261-263
S. A. E. Annual Meeting and Banquet.....	263
Motor and Accessory Manufacturers' Annual Meeting.....	263
First Pan-American Aeronautic Exposition.....	263
Chemistry:	
What the Rubber Chemists Are Doing.....	264-265
Methods of Analysis.....	265-266
Chemical Patents.....	266
Laboratory Apparatus.....	Illustrated 266
Machines and Appliances, New.....	Illustrated 267-269
Rubber Mill Steam Turbine. New Three-Way Delivery Head Straining Machine. Hand and Power Brushes for Rubber Workers. Anderson Float-Type Steam Trap. Motor-Driven Test-Piece Grinder. Tire Mold and Core Cleaning Machines.....	
Machinery Patents.....	Illustrated 269-271
Overflow Trimming Machine. Machine for Vulcanizing Hose in Continuous Lengths. Horizontal Press Vulcanizer. Tube Making Machine. Safety Guard for Washers and Mills. Machine for Molding Hollow Rubber Articles. Other Machinery Patents.....	
Process Patents.....	Illustrated 271
Miller Cord Tire. Molding Fountain Pen Barrels. Archer Cord Tire. Other Process Patents.....	
Miscellaneous Patents.....	Illustrated 271
French Pneumatic Wheel.....	
New Goods and Specialties.....	Illustrated 272-274
Pineau's Cape Cod Pneumatic Life Saving Belt. Crêpe Rubber Flowers. Tire Repair Preparations. Pape "Theraphone" Receiver Earpiece. Moisture-Proof Attachment Plugs. Balanced Whip Golf Club. Hard Rubber Submarine Jars. Floor Treads and Motor-Car Covers. Combination Dash and Trouble Lamp. Marshall's Lineman's Shoe. Perkins' Spark Plug Tester. Pneumatic Security Bolt. A Pneumatic Wheel. "New Giant" Single-Tread Solid Tire. Rubber in the Flotation Process.....	
Editor's Book Table.....	275
"The Chemistry and Technology of Paints." "The India Rubber, Gutta-Percha and Electrical Diary and Year Book, 1917" "Gasoline and How to Use It." "The Maintenance of Health in the Tropics.".....	
New Trade Publications.....	275-276
Calendars and Souvenirs.....	276
Interesting Letters from Our Readers.....	277
Obituary Record.....	278
J. M. Miller (Portrait). C. O. Benton. F. R. Lyman. J. F. Bates.....	
Judicial Decisions.....	278
Inquiries and Trade Opportunities.....	280
American Rubber Trade—News Notes and Personals.....	279-285
Rubber Company Dividends.....	282
Rubber Share Quotations.....	282
New Incorporations.....	282
Tire Price Advance.....	285
United States Rubber Co.'s Refinancing Plan.....	286
Rubber Footwear Prices.....	286
Domestic Correspondence:	
Boston..... By Our Correspondent—Illustrated.....	287-288
Akron..... By Our Correspondent.....	288-289
Rhode Island..... By Our Correspondent.....	289-290
Trenton..... By Our Correspondent.....	290
Foreign Rubber News:	
Great Britain..... By a Special Correspondent.....	291
Scandinavia..... By Our Correspondent.....	291-292
Japan..... By a Special Correspondent.....	292-293
Siam's Imports of Rubber Goods.....	293
Planting Notes, Rubber.....	294-295
Malaya..... By Our Correspondent.....	295-296
Dutch Guiana, Fighting the Leaf Disease in.....	297
Patents Relating to Rubber.....	298-299
United States, United Kingdom, French Republic.....	
Trade Marks.....	299-300
United States, United Kingdom, French Republic.....	
Designs.....	Illustrated 300
Future Rubber Position.....	300
Markets:	
Crude Rubber During 1916.....	Chart 301
London View During 1916.....	Chart 301-303
Summary of New York Prices for 1916.....	303
During the Past Month.....	304-305
Market Cables.....	305
Singapore Rubber Auctions.....	305
Rubber Scrap.....	312
Cotton and Other Fabrics.....	311-312
Chemicals and Ingredients.....	312-313
Statistics:	
Brazil, Rubber Exports from Para and Manaus During December, 1916.....	303
Canada Rubber Statistics for October, 1916.....	310
Ceylon, Rubber Exports and Imports.....	305
Cotton Crop Movement.....	312
Federated Malay States, Rubber Exports.....	303
Italy, Rubber Statistics for September, 1916.....	311
Malaya, Rubber Exports.....	305
Straits Settlements, Rubber Exports.....	305
Singapore, Rubber Imports and Exports.....	305-306
United Kingdom Rubber Statistics.....	303
London and Liverpool Rubber Statistics.....	306
United States, Custom House Statistics.....	308
New York Arrivals of Crude Rubber.....	307-308
Imports and Exports of Crude and Manufactured Rubber.....	309
Rubber Statistics for November, 1916.....	310
Seattle, Arrivals of Crude Rubber.....	308

